



China Naval Modernization: Implications for U.S. Navy Capabilities—Background and Issues for Congress

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Summary

The question of how the United States should respond to China's military modernization effort, including its naval modernization effort, has emerged as a key issue in U.S. defense planning. The question is of particular importance to the U.S. Navy, because many U.S. military programs for countering improved Chinese military forces would fall within the Navy's budget.

Two DOD strategy and budget documents released in January 2012 state that U.S. military strategy will place a renewed emphasis on the Asia-Pacific region, and that as a result, there will be a renewed emphasis on air and naval forces in DOD plans. Administration officials have stated that notwithstanding reductions in planned levels of U.S. defense spending, the U.S. military presence in the Asia-Pacific region will be maintained and strengthened.

Decisions that Congress and the executive branch make regarding U.S. Navy programs for countering improved Chinese maritime military capabilities could affect the likelihood or possible outcome of a potential U.S.-Chinese military conflict in the Pacific over Taiwan or some other issue. Some observers consider such a conflict to be very unlikely, in part because of significant U.S.-Chinese economic linkages and the tremendous damage that such a conflict could cause on both sides. In the absence of such a conflict, however, the U.S.-Chinese military balance in the Pacific could nevertheless influence day-to-day choices made by other Pacific countries, including choices on whether to align their policies more closely with China or the United States. In this sense, decisions that Congress and the executive branch make regarding U.S. Navy programs for countering improved Chinese maritime military forces could influence the political evolution of the Pacific, which in turn could affect the ability of the United States to pursue goals relating to various policy issues, both in the Pacific and elsewhere.

China's naval modernization effort, which began in the 1990s, encompasses a broad array of weapon acquisition programs, including anti-ship ballistic missiles (ASBMs), submarines, and surface ships. China's naval modernization effort also includes reforms and improvements in maintenance and logistics, naval doctrine, personnel quality, education, training, and exercises. Observers believe that the near-term focus of China's military modernization effort has been to develop military options for addressing the situation with Taiwan. Consistent with this goal, observers believe that China wants its military to be capable of acting as a so-called anti-access force—a force that can deter U.S. intervention in a conflict involving Taiwan, or failing that, delay the arrival or reduce the effectiveness of intervening U.S. naval and air forces. Observers believe that China's military modernization effort, including its naval modernization effort, is increasingly oriented toward pursuing additional goals, such as asserting or defending China's territorial claims in the South China Sea and East China Sea; enforcing China's view—a minority view among world nations—that it has the right to regulate foreign military activities in its 200-mile maritime exclusive economic zone (EEZ); protecting China's sea lines of communications; protecting and evacuating Chinese nationals in foreign countries; displacing U.S. influence in the Pacific; and asserting China's status as a major world power.

Potential oversight issues for Congress include the following: whether the U.S. Navy in coming years will be large enough to adequately counter improved Chinese maritime anti-access forces while also adequately performing other missions of interest to U.S. policymakers around the world; the Navy's ability to counter Chinese ASBMs and submarines; and whether the Navy, in response to China's maritime anti-access capabilities, should shift over time to a more distributed fleet architecture.

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Introduction

Issue for Congress

The question of how the United States should respond to China's military modernization effort, including its naval modernization effort, has emerged as a key issue in U.S. defense planning. The Department of Defense (DOD) stated in 2011 that "China's rise as a major international actor is likely to stand out as a defining feature of the strategic landscape of the early 21st Century," and that China's military "is now venturing into the global maritime domain, a sphere long dominated by the U.S. Navy."¹ Admiral Michael Mullen, the then-Chairman of the Joints Chiefs of Staff, stated in June 2010 that "I have moved from being curious to being genuinely concerned" about China's military programs.²

The question of how the United States should respond to China's military modernization effort is of particular importance to the U.S. Navy, because many U.S. military programs for countering improved Chinese military forces would fall within the Navy's budget. An October 19, 2011, press report stated:

The US Navy views the Asia-Pacific region as a top strategic priority even as it faces possible budget cuts that could curtail other global missions, the naval chief said Wednesday [October 19].

With China's clout rising and its military might expanding, President Barack Obama's deputies and military commanders increasingly portray Asia as a key to American national security.

The new chief of naval operations, Admiral Jonathan Greenert, echoed that view and suggested growing pressure on the US defense budget would not derail plans to focus on the Pacific region.

"Asia will be clearly a priority and we will adjust our operations accordingly," Greenert told reporters in a teleconference.³

Decisions that Congress and the executive branch make regarding U.S. Navy programs for countering improved Chinese maritime military capabilities could affect the likelihood or possible outcome of a potential U.S.-Chinese military conflict in the Pacific over Taiwan or some other issue. Some observers consider such a conflict to be very unlikely, in part because of significant U.S.-Chinese economic linkages and the tremendous damage that such a conflict could cause on both sides. In the absence of such a conflict, however, the U.S.-Chinese military balance

¹ U.S. Department of Defense, *Annual Report to Congress [on] Military and Security Developments Involving the People's Republic of China 2011*. Washington, 2011. Executive summary and p. 1.

² Viola Gienger, "U.S. Concern Over China's Military Intent Growing, Mullen Says," *Bloomberg.com*, June 10, 2010. See also Daniel Ten Kate, "U.S. Criticism Of China's Military May Overshadow Asian Security Meeting," *Bloomberg.com*, July 15, 2010; and Jon Rabirow, "Mullen Moves From 'Curious' To 'Concerned' Over China's Military," *Stripes.com*, July 21, 2010.

See also the February 28, 2012, testimony of Admiral Robert Willard, Commander, U.S. Pacific Command, before the Senate Armed Services Committee in **Appendix A**.

³ Dan De Luce, "For US Navy, Asia is crucial priority: admiral," *Agence France-Presse*, October 19, 2011.

in the Pacific could nevertheless influence day-to-day choices made by other Pacific countries, including choices on whether to align their policies more closely with China or the United States. In this sense, decisions that Congress and the executive branch make regarding U.S. Navy programs for countering improved Chinese maritime military forces could influence the political evolution of the Pacific, which in turn could affect the ability of the United States to pursue goals relating to various policy issues, both in the Pacific and elsewhere.

Scope, Sources, and Terminology

This report focuses on the potential implications of China's naval modernization for future required U.S. Navy capabilities. Other CRS reports address separate issues relating to China.

This report is based on unclassified open-source information, such as the annual DOD report to Congress on military and security developments involving China,⁴ an August 2009 report on China's navy from the Office of Naval Intelligence (ONI),⁵ published reference sources such as *Jane's Fighting Ships*, and press reports.

For convenience, this report uses the term China's naval modernization to refer to the modernization not only of China's navy, but also of Chinese military forces outside China's navy that can be used to counter U.S. naval forces operating in the Western Pacific, such as land-based anti-ship ballistic missiles (ASBMs), land-based surface-to-air missiles (SAMs), land-based air force aircraft armed with anti-ship cruise missiles (ASCMs), and land-based long-range radars for detecting and tracking ships at sea.

China's military is formally called the People's Liberation Army, or PLA. Its navy is called the PLA Navy, or PLAN (also abbreviated as PLA[N]), and its air force is called the PLA Air Force, or PLAAF. The PLA Navy includes an air component that is called the PLA Naval Air Force, or PLANAF. China refers to its ballistic missile force as the Second Artillery Corps (SAC).

⁴ Department of Defense, *Annual Report to Congress [on] Military and Security Developments Involving the People's Republic of China 2013*. Washington, May 2013. 83 pp. Hereinafter *2013 DOD CMSD*. The 2010-2012 editions of the report are cited similarly. The 2009 and earlier editions of the report were known as the China military power report; the 2009 edition is cited as *2009 DOD CMP*, and earlier editions are cited similarly.

⁵ Office of Naval Intelligence, *The People's Liberation Army Navy, A Modern Navy with Chinese Characteristics*, Suitland (MD), Office of Naval Intelligence, August 2009. 46 pp. (Hereinafter *2009 ONI Report*.)

Background

Overview of China's Naval Modernization Effort⁶

Date of Inception

Observers date the beginning of China's naval modernization effort to various points in the 1990s.⁷ Design work on the first of China's newer ship classes appears to have begun in the later 1980s.⁸ Some observers believe that China's naval modernization effort may have been reinforced or accelerated by a 1996 incident in which the United States deployed two aircraft carrier strike groups to waters near Taiwan in response to Chinese missile tests and naval exercises near Taiwan.⁹

Elements of Modernization Effort

China's naval modernization effort encompasses a broad array of weapon acquisition programs, including programs for anti-ship ballistic missiles (ASBMs), anti-ship cruise missiles (ASCMs), land-attack cruise missiles (LACMs), surface-to-air missiles, mines, manned aircraft, unmanned aircraft, submarines, aircraft carriers, destroyers, frigates, patrol craft, amphibious ships, mine countermeasures (MCM) ships, hospital ships, and supporting C4ISR¹⁰ systems. Some of these acquisition programs have attracted particular interest and are discussed in further detail below. China's naval modernization effort also includes reforms and improvements in maintenance and logistics, naval doctrine, personnel quality, education and training, and exercises.¹¹

Limitations and Weaknesses

Although China's naval modernization effort has substantially improved China's naval capabilities in recent years, observers believe China's navy continues to exhibit limitations or weaknesses in several areas, including capabilities for sustained operations by larger formations in distant waters,¹² joint operations with other parts of China's military,¹³ antisubmarine warfare

⁶ Unless otherwise indicated, shipbuilding program information in this section is taken from *Jane's Fighting Ships 2012-2013*, and previous editions. Other sources of information on these shipbuilding programs may disagree regarding projected ship commissioning dates or other details, but sources present similar overall pictures regarding PLA Navy shipbuilding.

⁷ China ordered its first four Russian-made Kilo-class submarines in 1993, and its four Russian-made Sovremenny-class destroyers in 1996. China laid the keel on its first Song (Type 039) class submarine in 1991, its first Luhui (Type 052) class destroyer in 1990, its Luhai (Type 051B) class destroyer in 1996, and its first Jiangwei I (Type 053 H2G) class frigate in 1990.

⁸ First-in-class ships whose keels were laid down in 1990 or 1991 (see previous footnote) likely reflect design work done in the latter 1980s.

⁹ DOD, for example, stated in 2011 that "The U.S. response in the 1995-96 Taiwan Strait crisis underscored to Beijing the potential challenge of U.S. military intervention and highlighted the importance of developing a modern navy, capable of conducting A2AD [anti-access/area-denial] operations, or 'counter-intervention operations' in the PLA's lexicon." (2011 DOD CMSD, p. 57.)

¹⁰ C4ISR stands for command and control, communications, computers, intelligence, surveillance, and reconnaissance.

¹¹ For a discussion of improvements in personnel, training, and exercises, see 2009 ONI Report, pp. 31-40.

¹² DOD stated in 2012 that "By the latter half of the current decade, China will likely be able to project and sustain a (continued...)"

(ASW), MCM, a dependence on foreign suppliers for some ship propulsion systems,¹⁴ and a lack of operational experience in combat situations.¹⁵ DOD states that

China would face several short-comings in a near-term A2/AD [anti-access/area-denial] operation [against opposing military forces]. First, it has not developed a robust, deep water anti-submarine warfare capability, in contrast to its strong capabilities in the air and surface domains. Second, it is not clear whether China has the capability to collect accurate targeting information and pass it to launch platforms in time for successful strikes in sea areas beyond the first island chain. However, China is working to overcome these shortcomings.¹⁶

The sufficiency of a country's naval capabilities is best assessed against that navy's intended missions. Although China's navy has limitations and weaknesses, it may nevertheless be sufficient for performing certain missions of interest to Chinese leaders. As China's navy reduces its weaknesses and limitations, it may become sufficient to perform a wider array of potential missions.

Goals of Naval Modernization Effort

Capabilities for Taiwan Scenarios, Including Acting as Anti-Access/Area-Denial (A2/AD) Force

DOD and other observers believe that the near-term focus of China's military modernization effort, including its naval modernization effort, has been to develop military options for addressing the situation with Taiwan.¹⁷ Consistent with this goal, observers believe that China wants its military to be capable of acting as a so-called anti-access/area-denial (A2/AD) force—a force that can deter U.S. intervention in a conflict involving Taiwan, or failing that, delay the arrival or reduce the effectiveness of intervening U.S. naval and air forces.

ASBMs, attack submarines, and supporting C4ISR systems are viewed as key elements of China's emerging maritime A2/AD force, though other force elements—such as ASCMs, LACMs (for attacking U.S. air bases and other facilities in the Western Pacific), and mines—are also of significance.¹⁸

(...continued)

modest-sized force, perhaps several battalions of ground forces or a naval flotilla of up to a dozen ships, in low-intensity operations far from China. This evolution will lay the foundation for a force able to accomplish a broader set of regional and global objectives. However, it is unlikely that China will be able to project and sustain large forces in high-intensity combat operations far from China prior to 2020.” (2011 DOD CMSD, p. 27.)

¹³ DOD stated in 2011 that “Despite significant improvements, the PLA continues to face deficiencies in inter-service cooperation and actual experience in joint exercises and combat operations.” (2011 DOD CMSD, p. 27.)

¹⁴ DOD states that China's naval shipbuilding industry “continues to invest in foreign suppliers for some [ship] propulsion units, but is becoming increasingly self-reliant.” (2013 DOD CMSD, p. 48.)

¹⁵ DOD stated in 2010 that “the PLA remains untested in modern combat. This lack of operational experience continues to complicate outside assessment of the progress of China's military transformation.” (2010 DOD CMSD, p. 22)

¹⁶ 2013 DOD CMSD, p. 35.

¹⁷ For a DOD summary of these options—including maritime quarantine or blockade, limited force or coercive options, an air and missile campaign, and an amphibious invasion—see 2013 DOD CMSD, pp. 56-57.

¹⁸ DOD states that

As part of its planning for military contingencies, China continues to develop measures to deter or
(continued...)

China's emerging maritime A2/AD force can be viewed as broadly analogous to the sea-denial force that the Soviet Union developed during the Cold War to deny U.S. use of the sea or counter U.S. forces participating in a NATO-Warsaw Pact conflict. One potential difference between the Soviet sea-denial force and China's emerging maritime A2/AD force is that China's force includes ASBMs capable of hitting moving ships at sea.

Additional Goals Not Directly Related to Taiwan

DOD and other observers also believe that China's military modernization effort, including its naval modernization effort, is increasingly oriented toward pursuing additional goals not directly related to Taiwan, including the following:

- asserting or defending China's territorial claims in the South China Sea (SCS) and East China Sea (ECS)—claims that overlap with those of other countries and, in the case of the South China Sea, are somewhat ambiguous but potentially expansive enough to go well beyond what would normally be supported by international legal norms relating to territorial waters;¹⁹
- enforcing China's view—a minority view among world nations—that it has the legal right to regulate foreign military activities in its 200-mile maritime exclusive economic zone (EEZ);²⁰

(...continued)

counter third-party intervention, particularly by the United States. China's approach to dealing with this challenge is manifested in a sustained effort to develop the capability to attack, at long ranges, military forces that might deploy or operate within the western Pacific, which the DoD characterizes as "anti-access" and "area denial" (A2/AD) capabilities. China is pursuing a variety of air, sea, undersea, space and counter-space, and information warfare systems and operational concepts to achieve this capability, moving toward an array of overlapping, multilayered offensive capabilities extending from China's coast into the western Pacific....

... China's A2/AD focus appears oriented toward restricting or controlling access to China's periphery, including the western Pacific. China's current and projected force structure improvements, for example, will provide the PLA with systems that can engage adversary surface ships up to 1,000 nm from China's coast....

The PLA Navy is in the forefront of China's A2/AD developments, having the greatest range and staying power within the PLA to interdict third-party forces. In a near-term conflict, PLA Navy operations would likely begin in the offshore and coastal areas with attacks by coastal defense cruise missiles, maritime strike aircraft, and smaller combatants, and extend as far as the second island chain and Strait of Malacca using large surface ships and submarines. As the PLA Navy gains experience and acquires larger numbers of more capable platforms, including those with long-range air defense, it will expand the depth of these operations further into the Western Pacific. It will also develop a new capability for ship-based land-attack using cruise missiles. China views long-range anti-ship cruise missiles as a key weapon in this type of operation and is developing multiple advanced types and the platforms to employ them for this purpose.

2013 DOD CMSD, pp. 32, 34-35.

¹⁹ For more on China's territorial claims in the SCS and ECS, see CRS Report R42784, *Maritime Territorial and Exclusive Economic Zone (EEZ) Disputes Involving China: Issues for Congress*, by Ronald O'Rourke, and CRS Report R42930, *Maritime Territorial Disputes in East Asia: Issues for Congress*, by Ben Dolven, Shirley A. Kan, and Mark E. Manyin.

²⁰ For more on China's view regarding its rights within its EEZ, see CRS Report R42784, *Maritime Territorial and Exclusive Economic Zone (EEZ) Disputes Involving China: Issues for Congress*, by Ronald O'Rourke.

- protecting China's sea lines of communications, including those running through the Indian Ocean to the Persian Gulf, on which China relies for much of its energy imports;
- protecting and evacuating Chinese nationals living and working in foreign countries;
- displacing U.S. influence in the Pacific; and
- asserting China's status as a major world power.

The above goals not directly related to Taiwan suggest the following:

- China's maritime territorial claims have the potential for acting as a continuing cause of friction or tension in U.S.-Chinese relations.
- China's view that it has the legal right to regulate foreign military activities in its EEZ has the potential for acting as an ongoing source of potential incidents between U.S. and Chinese ships and aircraft in international waters and airspace close to China.
- In the absence of conflict, China's military forces, including in particular its naval forces, will be used on a day-to-day basis to promote China's political position in the Pacific. This would create an essentially political (as opposed to combat-related) reason for the United States or other countries to maintain a competitive presence in the region with naval and other forces that are viewed by observers in the Pacific as capable of effectively countering China's forces. Even if a U.S.-Chinese military conflict in the Pacific over Taiwan or some other issue were never to occur, the U.S.-Chinese military balance in the Pacific could nevertheless influence day-to-day choices made by other Pacific countries, including choices on whether to align their policies more closely with China or the United States. In this sense, decisions that Congress and the executive branch make regarding U.S. Navy programs for countering improved Chinese maritime military forces could influence the political evolution of the Pacific, which in turn could affect the ability of the United States to pursue goals relating to various policy issues, both in the Pacific and elsewhere.

DOD states that

Preparing for potential conflict in the Taiwan Strait appears to remain the principal focus and primary driver of China's military investment. However, as China's interests have grown and as it has gained greater influence in the international system, its military modernization has also become increasingly focused on investments in military capabilities to conduct a wider range of missions beyond its immediate territorial concerns, including counter-piracy, peacekeeping, humanitarian assistance/disaster relief, and regional military operations. Some of these missions and capabilities can address international security challenges, while others could serve more narrowly-defined PRC interests and objectives, including advancing territorial claims and building influence abroad.²¹

²¹ 2013 DOD CMSD, p. i. DOD similarly states on page 22 that "Publicly, Chinese officials contend that increasing the scope of China's maritime capabilities is intended to build capacity for international peacekeeping, humanitarian assistance, disaster relief, and protection of sea lanes," and on page 29 that

Current trends in China's weapons production will enable the PLA to conduct a range of military (continued...)

Another set of observers states that

in addition to domestic security/homeland defense, [China's military and navy] have two major layers:

1. China has already developed, and continues to develop rapidly, potent high-end navy and "anti-Navy" capabilities. Like their other military counterparts, they are focused almost entirely on contested areas close to home.
2. It is also developing low-end capabilities. They are relevant primarily for low-intensity peacetime missions in areas further afield.

These two very different dynamics should not be conflated.

The second area has attracted headlines recently. China is in the process of developing a limited out-of-area operational capability to extend political influence and protect vital economic interests and PRC citizens working abroad in volatile parts of Africa and other regions. In essence, China seeks the bonus of being able to show the flag outside East Asia without the onus of assuming the cost and political liabilities of building a truly global high-end naval capability.

But while selected PLA Navy (PLAN) vessels make history by calling on ports in the Black Sea and Mediterranean to include first-ever visits to Israel and Bulgaria, the majority (like the rest of China's armed forces) are focused on areas closer to home—primarily still-contested territorial and maritime claims in the Yellow, East China, and South China Seas....

Given Beijing's substantial focus on issues unlikely to be resolved anytime soon, it is hardly surprising that there are no reliable indications at this time that China desires a truly-global blue water navy akin to that of the U.S. today, or which the Soviet Union maintained for some time, albeit at the eventual cost of strategic overextension. China does seek [sic] to develop a "blue water" navy in the years to come—but one that is more "regional" than "global" in nature. Chinese strategists term this a "regional [blue-water] defensive and offensive-type" ... navy....

...we believe Beijing is building a navy to handle a high-intensity conflict close to home where it can be supported by its large fleet of conventionally-powered submarines and shore-based missiles and aircraft. Vessels such as China's soon-to-be-commissioned aircraft carrier and Type 071 amphibious assault ships could be helpful in certain limited conflict scenarios against far-less-capable opponents—particularly in the South China Sea. Yet these large but limited capital ships' most likely use will be for handling missions geared toward:

1. The regional mission of showing the flag in disputed areas and attempting to deter potential adversaries;

(...continued)

operations in Asia well beyond Taiwan, in the South China Sea, western Pacific, and Indian Ocean. Key systems that have been either deployed or are in development include ballistic missiles (including anti-ship variants), anti-ship and land attack cruise missiles, nuclear submarines, modern surface ships, and an aircraft carrier. The need to ensure trade, particularly oil supplies from the Middle East, has prompted China's navy to conduct counter-piracy operations in the Gulf of Aden.

2. Handling non-traditional security missions both in the East Asian/Western Pacific and Indian Ocean regions such as suppression of piracy, protecting/evacuating Chinese citizens trapped abroad by violence, and disaster response; as well as

3. Making diplomatically-oriented cruises such as the recent visits to Black Sea ports, which are aimed at showing the flag and showing foreign and domestic audiences that China is becoming a truly global power.

By contrast, there is currently little evidence that China is building a blue water capability to confront a modern navy like the U.S beyond the PLAN's East/Southeast Asian home-region waters. Beijing is accruing a limited expeditionary capability, but is not preparing to go head-to-head with U.S. carrier battle groups outside of East Asia and the Western Pacific. There are a number of key indicators of Chinese progress toward building a strong regional navy with limited global operational capabilities...

The PLAN is acquiring the hardware it needs to prosecute a major regional naval showdown. Simultaneously, an increasingly-capable, but still limited number, of vessels can fight pirates, rescue Chinese citizens trapped by violence abroad, and make "show-the-flag" visits around the world. But the PLAN is not set up to confront the U.S. at sea more than 1,000 miles from China. Even if the PLAN surged production of key vessels such as replenishment ships, the resources and steps needed to build a globally-operational navy leave Beijing well over a decade away from achieving such capability in hardware terms alone. Building the more complex human software and operational experience needed to become capable of conducting large-scale, high-end out-of-area deployments could require at least another decade. Meanwhile, however, China's challenges at home and on its contested periphery remain so pressing as to preclude such focus for the foreseeable future.

The bottom line is that China's present naval shipbuilding program aims to replace aging vessels and modernize the fleet, not to scale-up a modern fleet to the size and composition necessary to support and sustain high-end blue water power projection. China is building a two-layered navy with a high-end Near Seas component and a limited, low-end capability beyond, not the monolithic force that some assume.²²

²² Andrew Erickson and Gabe Collins, "China's Real Blue Water Navy," *The Diplomat* (<http://thediplomat.com>), August 30, 2012, accessed online on October 12, 2012, at <http://thediplomat.com/2012/08/30/chinas-not-so-scary-navy/>. The bracketed phrase "[blue-water]" is as in the original. Another observer states:

China's active defense strategy has a maritime component that aligns with the PRC's 1982 naval maritime plan outlined by then-Vice Chairman of the Military Commission, Liu Huaqing. This naval strategy delineated three stages. In the first stage, from 2000 to 2010, China was to establish control of waters within the first island chain that links Okinawa Prefecture, Taiwan and the Philippines. In the second stage, from 2010 to 2020, China would seek to establish control of waters within the second island chain that links the Ogasawara island chain, Guam and Indonesia. The final stage, from 2020 until 2040, China would put an end to U.S. military dominance in the Pacific and Indian Oceans, using aircraft carriers as a key component of their military force.

Recent Chinese military developments, rhetoric, and actions reflect implementation of this maritime strategy, on pace with the projections to seek control of the first island chain.

(Prepared statement by Stacy A. Pedrozo, Capt, JAGC, USN, U.S. Navy Military Fellow, Council on Foreign Relations, Before the U.S.-China Economic & Security Review Commission, January 27, 2011, p. 2. For a DOD map showing the first and second island chains, see *2013 DOD CMSD*, p. 81.)

*China's View Regarding Right to Regulate Foreign Military Activities in EEZ*²³

China's view that it has the legal right to regulate foreign military activities in its EEZ appears to be at the heart of multiple incidents between Chinese and U.S. ships and aircraft in international waters and airspace, including incidents in March 2001, September 2002, March 2009, and May 2009 in which Chinese ships and aircraft confronted and harassed the U.S. naval ships *Bowditch*, *Impeccable*, and *Victorious* as they were conducting survey and ocean surveillance operations in China's EEZ, and an incident on April 1, 2001, in which a Chinese fighter collided with a U.S. Navy EP-3 electronic surveillance aircraft flying in international airspace about 65 miles southeast of China's Hainan Island in the South China Sea, forcing the EP-3 to make an emergency landing on Hainan island.²⁴

The issue of whether China has the right under UNCLOS to regulate foreign military activities in its EEZ is related to, but ultimately separate from, the issue of maritime territorial disputes in the SCS and ECS. The two issues are related because China can claim EEZs from inhabitable islands over which it has sovereignty, so accepting China's claims to islands in the SCS or ECS could permit China to expand the EEZ zone within which China claims a right to regulate foreign military activities.

The EEZ issue is ultimately separate from the territorial disputes issue because even if all the territorial disputes in the SCS and ECS were resolved, and none of China's claims in the SCS and ECS were accepted, China could continue to apply its concept of its EEZ rights to the EEZ that it unequivocally derives from its mainland coast—and it is in this unequivocal Chinese EEZ that most of the past U.S.-Chinese incidents at sea have occurred.

If China's position on whether coastal states have a right under UNCLOS to regulate the activities of foreign military forces in their EEZs were to gain greater international acceptance under international law, it could substantially affect U.S. naval operations not only in the SCS and ECS, but around the world, which in turn could substantially affect the ability of the United States to use its military forces to defend U.S. interests overseas. Significant portions of the world's oceans are claimable as EEZs, including high-priority U.S. Navy operating areas in the Western Pacific, the Persian Gulf, and the Mediterranean Sea. The legal right of U.S. naval forces to operate freely in EEZ waters is important to their ability to perform many of their missions around the world, because many of those missions are aimed at influencing events ashore, and having to conduct operations from more than 200 miles offshore would reduce the inland reach and responsiveness of ship-based sensors, aircraft, and missiles, and make it more difficult to transport Marines and their equipment from ship to shore. Restrictions on the ability of U.S. naval forces to operate in

²³ For further discussion of this topic, see CRS Report R42784, *Maritime Territorial and Exclusive Economic Zone (EEZ) Disputes Involving China: Issues for Congress*, by Ronald O'Rourke.

²⁴ For discussions of some of these incidents and their connection to the issue of military operating rights in EEZs, see Raul Pedrozo, "Close Encounters at Sea, The USNS Impeccable Incident," *Naval War College Review*, Summer 2009: 101-111; Jonathan G. Odom, "The True 'Lies' of the Impeccable Incident: What Really Happened, Who Disregarded International Law, and Why Every Nation (Outside of China) Should Be Concerned," *Michigan State Journal of International Law*, vol. 18, no. 3, 2010: 16-22, accessed online September 25, 2012 at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1622943; Oriana Skylar Mastro, "Signaling and Military Provocation in Chinese National Security Strategy: A Closer Look at the Impeccable Incident," *Journal of Strategic Studies*, April 2011: 219-244; and Peter Dutton, ed., *Military Activities in the EEZ, A U.S.-China Dialogue on Security and International Law in the Maritime Commons*, Newport (RI), Naval War College, China Maritime Studies Institute, China Maritime Study Number 7, December 2010, 124 pp. See also CRS Report RL30946, *China-U.S. Aircraft Collision Incident of April 2001: Assessments and Policy Implications*, by Shirley A. Kan et al.

EEZ waters could potentially require a change in U.S. military strategy or U.S. foreign policy goals.

Selected Elements of China's Naval Modernization Effort

Anti-Ship Ballistic Missiles (ASBMs)

China for several years has been developing and testing an anti-ship ballistic missile (ASBM), referred to as the DF-21D, that is a theater-range ballistic missile²⁵ equipped with a maneuverable reentry vehicle (MaRV) designed to hit moving ships at sea. DOD states that

China is fielding a limited but growing number of conventionally armed, medium-range ballistic missiles, including the DF-21D anti-ship ballistic missile (ASBM). The DF-21D is based on a variant of the DF-21 (CSS-5) medium-range ballistic missile (MRBM) and gives the PLA the capability to attack large ships, including aircraft carriers, in the western Pacific Ocean. The DF-21D has a range exceeding 1,500 km [810 nautical miles] and is armed with a maneuverable warhead.²⁶

Another observer states that “the DF-21D’s warhead apparently uses a combination of radar and optical sensors to find the target and make final guidance updates.... Finally, it uses a high explosive, or a radio frequency or cluster warhead that at a minimum can achieve a mission kill [against the target ship].”²⁷

Observers have expressed strong concern about the DF-21D, because such missiles, in combination with broad-area maritime surveillance and targeting systems, would permit China to attack aircraft carriers, other U.S. Navy ships, or ships of allied or partner navies operating in the Western Pacific. The U.S. Navy has not previously faced a threat from highly accurate ballistic missiles capable of hitting moving ships at sea. For this reason, some observers have referred to the DF-21 as a “game-changing” weapon. Due to their ability to change course, the MaRVs on an ASBM would be more difficult to intercept than non-maneuvering ballistic missile reentry vehicles.²⁸

²⁵ Depending on their ranges, these theater-range ballistic missiles can be divided into short-, medium-, and intermediate-range ballistic missiles (SRBMs, MRBMs, and IRBMs, respectively).

²⁶ 2013 DOD CMSD, p. 5. See also 2009 ONI Report, pp. 26-27.

²⁷ Richard Fisher, Jr., “PLA and U.S. Arms Racing in the Western Pacific,” available online at http://www.strategycenter.net/research/pubID.247/pub_detail.asp. A mission kill means that the ship is damaged enough that it cannot perform its intended mission.

²⁸ For further discussion of China’s ASBM-development effort and its potential implications for U.S. naval forces, see Craig Hooper and Christopher Albon, “Get Off the Fainting Couch,” *U.S. Naval Institute Proceedings*, April 2010: 42-47; Andrew S. Erickson, “Ballistic Trajectory—China Develops New Anti-Ship Missile,” *Jane’s Intelligence Review*, January 4, 2010; Michael S. Chase, Andrew S. Erickson and Christopher Yeaw, “Chinese Theater and Strategic Missile Force Modernization and its Implications for the United States,” *The Journal of Strategic Studies*, February 2009: 67-114; Andrew S. Erickson and David D. Yang, “On the Verge of a Game-Changer,” *U.S. Naval Institute Proceedings*, May 2009: 26-32; Andrew Erickson, “Facing A New Missile Threat From China, How The U.S. Should Respond To China’s Development Of Anti-Ship Ballistic Missile Systems,” *CBSNews.com*, May 28, 2009; Andrew S. Erickson, “Chinese ASBM Development: Knowns and Unknowns,” *China Brief*, June 24, 2009: 4-8; Andrew S. Erickson and David D. Yang, “Using the Land to Control the Sea? Chinese Analysts Consider the Antiship Ballistic Missile,” *Naval War College Review*, Autumn 2009: 53-86; Eric Hagt and Matthew Durnin, “China’s Antiship Ballistic Missile, Developments and Missing Links,” *Naval War College Review*, Autumn 2009: 87-115; Mark Stokes, “China’s Evolving Conventional Strategic Strike Capability, *The Anti-ship Ballistic Missile Challenge to U.S. Maritime* (continued...) ”

Regarding the operational status of the DF-21D, DOD states that China “began deploying [the DF-21D] in 2010.”²⁹ A DOD official has stated that China is “augmenting the over 1,200 conventional short-range ballistic missiles deployed opposite Taiwan with a limited but growing number of conventionally armed, medium-range ballistic missiles, including the DF-21D anti-ship ballistic missile,”³⁰ and that “there are a number of notable examples of China’s improving military capabilities, including five new stealth and conventional aircraft programs and the initial deployment of a new anti-ship ballistic missile that we believe is designed to target U.S. aircraft carriers.”³¹

A January 23, 2013, press report about a test of the weapon in the Gobi desert in western China stated:

The People’s Liberation Army has successfully sunk a US aircraft carrier, according to a satellite photo provided by Google Earth, reports our sister paper *Want Daily*—though the strike was a war game, the carrier a mock-up platform and the “sinking” occurred on dry land in a remote part of western China.³²

Anti-Ship Cruise Missiles (ASCMs)

Among the most capable of the new ASCMs that have been acquired by China’s navy are the Russian-made SS-N-22 Sunburn (carried by China’s four Russian-made Sovremenny-class destroyers) and the Russian-made SS-N-27 Sizzler (carried by 8 of China’s 12 Russian-made Kilo-class submarines). China’s large inventory of ASCMs also includes several indigenous designs. DOD states that China “has, or is acquiring, nearly a dozen ASCM variants, ranging from the 1950s-era CSS-N-2 to the modern Russian-made SS-N-22 and SS-N-27B. China is working to develop a domestically-built supersonic cruise missile capability. The pace of ASCM research, development, and production has accelerated over the past decade.”³³

(...continued)

Operations in the Western Pacific and Beyond, Project 2049 Institute, September 14, 2009. 123 pp.

²⁹ 2013 DOD CMSD, p. 38. Page 42 states:

Intermediate-Range Ballistic Missiles (3,000-5,000 km): The PLA is developing conventional intermediate-range ballistic missiles (IRBM), increasing its capability for near-precision strike out to the second island chain. The PLA Navy is also improving its over-the-horizon (OTH) targeting capability with sky wave and surface wave OTH radars, which can be used in conjunction with reconnaissance satellites to locate targets at great distances from China (thereby supporting long-range precision strikes, including employment of ASBMs).

Another DOD report published in 2013 states that “China has likely started to deploy the DF-21D....” (National Air and Space Intelligence Center, *Ballistic & Cruise Missile Threat*, Wright-Patterson Air Force Base, OH, 2013, p. 14.)

³⁰ Michael T Flynn, Lieutenant General, U.S. Army, Director, Defense Intelligence Agency, Annual Threat Assessment, Statement Before the Senate Armed Services Committee, United States Senate, April 18, 2013, p. 17.

³¹ Statement of Admiral Samuel J. Locklear, U.S. Navy, Commander, U.S. Pacific Command, Before the Senate Armed Services Committee on U.S. Pacific Command Posture, April 9, 2013, p. 7. See also Andrew S. Erickson, “How CHina Got There First: Unique Path to ASBM Development and Deployment,” *China Brief*, June 7, 2013.

³² “PLA ‘Sinks’ US Carrier in DF-21D Missile Test in Gobi,” *Want China Times* (<http://www.wantchinatimes.com>), January 23, 2013, accessed March 21, 2013, at <http://www.wantchinatimes.com/news-subclass-cnt.aspx?id=20130123000112&cid=1101>.

³³ 2013 DOD CMSD, p. 42.

Submarines

China's submarine modernization effort has attracted substantial attention and concern. The August 2009 ONI report states that "since the mid-1990s, the PRC has emphasized the submarine force as one of the primary thrusts of its military modernization effort."³⁴

Types Acquired in Recent Years

China since the mid-1990s has acquired 12 Russian-made Kilo-class non-nuclear-powered attack submarines (SSs) and put into service at least four new classes of indigenously built submarines, including the following:

- a new nuclear-powered ballistic missile submarine (SSBN) design called the Jin class or Type 094 (**Figure 1**);
- a new nuclear-powered attack submarine (SSN) design called the Shang class or Type 093;³⁵
- a new SS design called the Yuan class or Type 039A (**Figure 2**);³⁶ and
- another (and also fairly new) SS design called the Song class or Type 039/039G.

Figure 1. Jin (Type 094) Class Ballistic Missile Submarine



Source: Photograph provided to CRS by Navy Office of Legislative Affairs, December 2010.

The Kilos and the four new classes of indigenously built submarines are regarded as much more modern and capable than China's aging older-generation submarines. At least some of the new indigenously built designs are believed to have benefitted from Russian submarine technology and design know-how.³⁷

DOD and other observers believe the Type 093 SSN design will be succeeded by a newer SSN design called the Type 095. The August 2009 ONI report includes a graph (see **Figure 3**) that

³⁴ 2009 ONI Report, p. 20.

³⁵ Some sources state that a successor to the Shang class SSN design, called the Type 095 SSN design, is in development.

³⁶ Some sources refer to the Yuan class as the Type 041.

³⁷ The August 2009 ONI report states that the Yuan class may incorporate quieting technology from the Kilo class. (2009 ONI Report, p. 23.)

shows the Type 095 SSN, along with the date 2015, suggesting that ONI projects that the first Type 095 will enter service that year.

Figure 2. Yuan (Type 039A) Class Attack Submarine



Source: Photograph provided to CRS by Navy Office of Legislative Affairs, December 2010.

DOD states that:

Three JIN-class SSBNs (Type 094) are currently operational, and up to five may enter service before China proceeds to its next generation SSBN (Type 096) over the next decade....

Two SHANG-class SSNs (Type 093) are already in service, and China is building four improved variants of the SHANG-class SSN, which will replace the aging HAN-class SSNs (Type 091). In the next decade, China will likely construct the Type 095 guided-missile attack submarine (SSGN), which may enable a submarine-based land-attack capability. In addition to likely incorporating better quieting technologies, the Type 095 will fulfill traditional anti-ship roles with the incorporation of torpedoes and anti-ship cruise missiles (ASCMs).

The current mainstay of the Chinese submarine force is modern diesel powered attack submarines (SS). In addition to 12 KILO-class submarines acquired from Russia in the 1990s and 2000s (eight of which are equipped with the SS-N-27 ASCM), the PLA Navy possesses 13 SONG-class SS (Type 039) and eight YUAN-class SSP (Type 039A). The YUAN-class SSP is armed similarly to the SONG-class SS, but also includes an air-independent power system. China may plan to construct up to 20 YUAN-class SSPs.³⁸

³⁸ 2013 DOD CMSD, pp. 6-7.

China in 2011 commissioned into a service a new type of non-nuclear-powered submarine, called the Qing class according to *Jane's Fighting Ships 2012-2013*, that is about one-third larger than the Yuan-class design. It is not clear whether this boat is the lead ship of a new class, or a one-of-a-kind submarine built for testing purposes. *Jane's Fighting Ships 2012-2013* refers to the boat as an auxiliary submarine (SSA).³⁹ Another observer refers to the boat as the Type 32 submarine, and states that it

was launched in Wuchang shipyard back in 2010. At the time, we thought it might be a new conventional submarine class to replace Yuan [class]. However, it turns out this is basically a one ship class that will be used to replace the old No. 200 Gulf Class ballistic missile test bed [submarine]. This [new boat] will likely be used to test out ballistic missiles as well as [a] new vertical launch system. It is [the] Chinese navy's new submarine test bed.⁴⁰

Press reports in December 2012 and March 2013 stated that China had signed an agreement with Russia to purchase two dozen Su-35 fighters and four Amur/Lada class Russian-designed non-nuclear-powered attack submarines for China's Navy, with two of the submarines being built in Russia and two being built in China.⁴¹ Russia, however, reportedly denied that such an agreement had been signed.⁴²

Figure 3 and **Figure 4**, which are taken from the August 2009 ONI report, show the acoustic quietness of Chinese nuclear- and non-nuclear-powered submarines, respectively, relative to that of Russian nuclear- and non-nuclear-powered submarines. The downward slope of the arrow in each figure indicates the increasingly lower noise levels (i.e., increasing acoustic quietness) of the submarine designs shown. In general, quieter submarines are more difficult for opposing forces to detect and counter. The green-yellow-red color spectrum on the arrow in each figure might be interpreted as a rough indication of the relative difficulty that a navy with capable antisubmarine warfare forces (such as the U.S. Navy) might have in detecting and countering these submarines: Green might indicate submarines that would be relatively easy for such a navy to detect and counter, yellow might indicate submarines that would be less easy for such a navy to detect and counter, and red might indicate submarines that would be more difficult for such a navy to detect and counter.

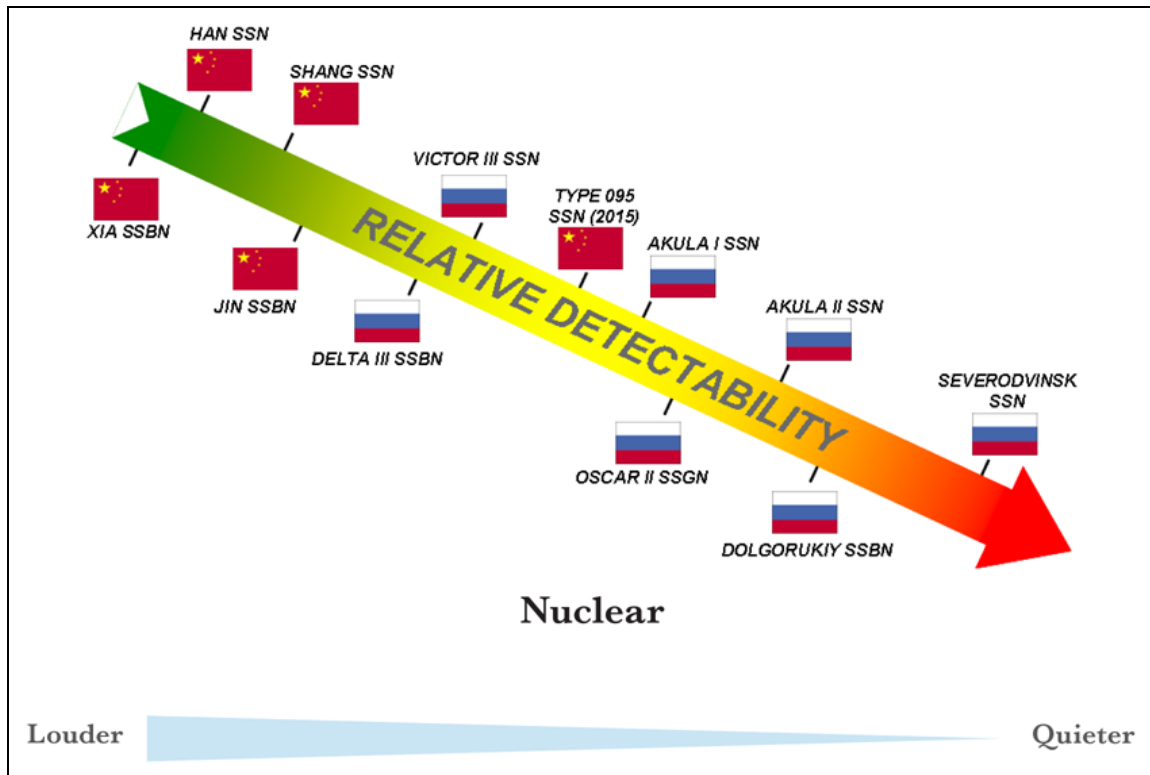
³⁹ *Jane's Fighting Ships 2012-2013*, p. 134.

⁴⁰ "China's Type 32 Class Submarine," *InformationDissemination.net*, July 23, 2013, accessed August 8, 2013, at <http://www.informationdissemination.net/2013/07/chinas-type-32-class-submarine.html>.

⁴¹ "China Mulls Buying Russian Submarines," *Moscow Times*, December 21, 2012, accessed March 21, 2013 at <http://www.themoscowtimes.com/business/article/china-mulls-buying-russian-submarines/473437.html>; "Russia to Sell Lada Class Submarines to China: Report," *Want China Times* (<http://www.wantchinatimes.com>), December 28, 2013, accessed March 21, 2013, at <http://www.wantchinatimes.com/news-subclass-cnt.aspx?id=20121228000007&cid=1101>; Agence France-Presse, "China To Buy Russian Fighters, Subs," *DefenseNews.com*, March 25, 2013.

⁴² Wendell Minnick, "Russia: No Deal on Sale of Fighters, Subs to China," *DefenseNews.com*, March 25, 2013.

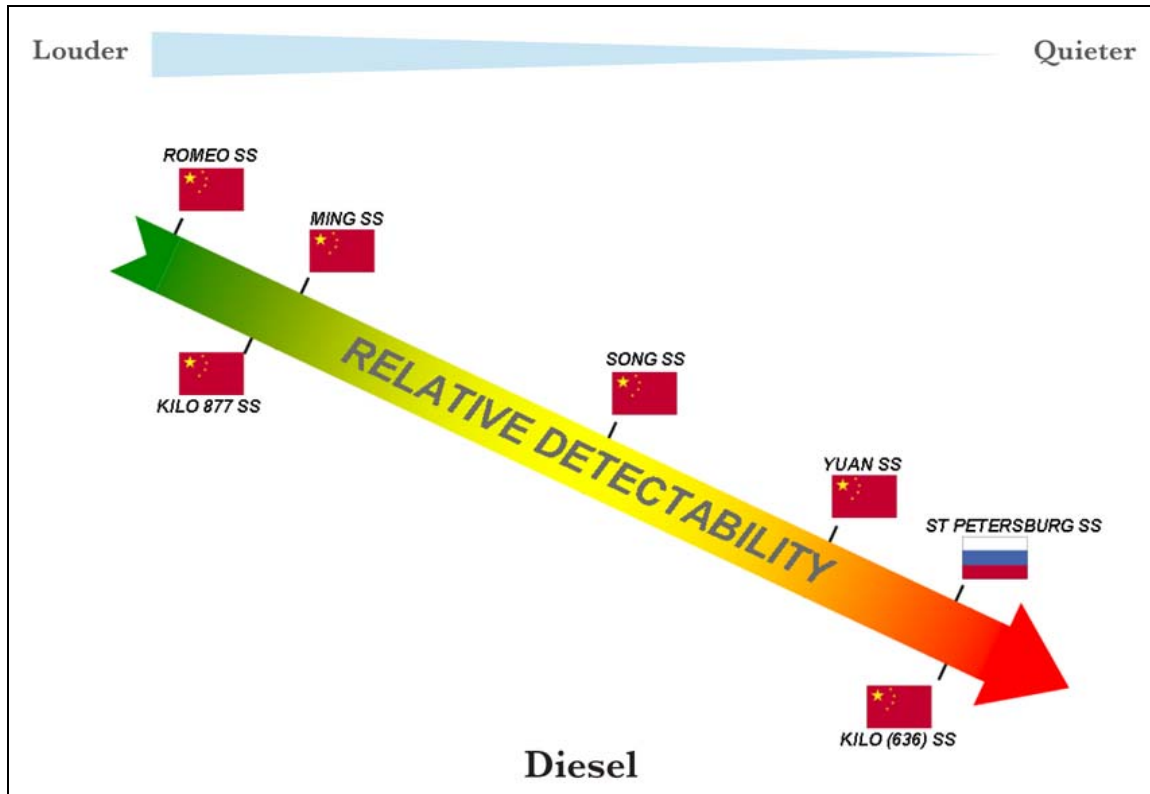
Figure 3. Acoustic Quietness of Chinese and Russian Nuclear-Powered Submarines



Source: 2009 ONI Report, p. 22.

Figure 4. Acoustic Quietness of Chinese and Russian Non-Nuclear-Powered Submarines

(Non-nuclear-powered submarines are commonly referred to as diesel or diesel-electric submarines)



Source: 2009 ONI Report, p. 22.

China's submarines are armed with one or more of the following: ASCMs, wire-guided and wake-homing torpedoes, and mines. The final eight Kilos purchased from Russia are reportedly armed with the highly capable Russian-made SS-N-27 Sizzler ASCM. In addition to other weapons, Shang-class SSNs may carry LACMs. Although ASCMs are often highlighted as sources of concern, wake-homing torpedoes are also a concern because they can be very difficult for surface ships to counter.

Although China's aging Ming-class (Type 035) submarines are based on old technology and are much less capable than China's newer-design submarines, China may decide that these older boats have continued value as minelayers or as bait or decoy submarines that can be used to draw out enemy submarines (such as U.S. SSNs) that can then be attacked by other Chinese naval forces.

In related areas of activity, China reportedly is developing new unmanned underwater vehicles,⁴³ and has modernized its substantial inventory of mines.⁴⁴ DOD stated in 2012 that "China has

⁴³ Lyle Goldstein and Shannon Knight, "Coming Without Shadows, Leaving Without Footprints," *U.S. Naval Institute Proceedings*, April 2010: 30-35.

⁴⁴ See, for example, Scott C. Truver, "Taking Mines Seriously, Mine Warfare in China's Near Seas," *Naval War College Review*, Spring 2012: 30-66.

developed torpedo and mine systems capable of area denial in a Taiwan scenario. Estimates of China's naval mine inventory exceed 50,000 mines, with many more capable systems developed in the past 10 years."⁴⁵

Submarine Acquisition Rate and Potential Submarine Force Size

Table 1 shows actual and projected commissionings of Chinese submarines by class since 1995, when China took delivery of its first two Kilo-class boats. The table includes the final nine boats in the Ming class, which is an older and less capable submarine design. As shown in **Table 1**, China by the end of 2012 is expected to have a total of 40 relatively modern attack submarines—meaning Shang, Kilo, Yuan, Song, and Qing class boats—in commission. As shown in the table, much of the growth in this figure occurred in 2004-2006, when 18 attack submarines (including 8 Kilo-class boats and 8 Song-class boats) were added, and in 2011-2012, when 9 attack submarines (including 8 Yuan-class boats and one Qing-class boat) were added or are expected to be added.

The figures in **Table 1** show that between 1995 and 2012, China placed or was expected to place into service a total of 51 submarines of all kinds, or an average of about 2.8 submarines per year. This average commissioning rate, if sustained indefinitely, would eventually result in a steady-state submarine force of about 57 to 85 boats of all kinds, assuming an average submarine life of 20 to 30 years.

Excluding the 12 Kilos purchased from Russia, the total number of domestically produced submarines placed into service between 1995 and 2012 is 39, or an average of about 2.2 per year. This average rate of domestic production, if sustained indefinitely, would eventually result in a steady-state force of domestically produced submarines of about 43 to 65 boats of all kinds, again assuming an average submarine life of 20 to 30 years.

The August 2009 ONI report states that “Chinese submarine procurement has focused on smaller numbers of modern, high-capability boats,” and that “over the next 10 to 15 years, primarily due to the introduction of new diesel-electric and [non-nuclear-powered] air independent power (AIP) submarines, the force is expected to increase incrementally in size to approximately 75 submarines.”⁴⁶

A May 16, 2013, press report quotes Admiral Samuel Locklear, the Commander of U.S. Pacific Command, as stating that China plans to acquire a total of 80 submarines.⁴⁷

⁴⁵ 2012 DOD CMSD, p. 23.

⁴⁶ 2009 ONI Report, p. 21. The report states on page 46 that “Because approximately three-quarters of the current submarine force will still be operational in 10-15 years, new submarine construction is expected to add approximately 10 platforms to the force.” See also the graph on page 45, which shows the submarine force leveling off in size around 2015.

⁴⁷ Richard Halloran, “China, US Engaging in Underwater Arms Race,” *Taipei Times*, May 16, 2013: 8, accessed May 17, 2013, at <http://www.taipeitimes.com/News/editorials/archives/2013/05/16/2003562368>.

Table 1. PLA Navy Submarine Commissionings

Actual (1995-2011) and Projected (2012-2016)

	Jin (Type 094) SSBN	Shang (Type 093) SSN	Kilo SS (Russian- made)	Ming (Type 035) SS ^b	Song (Type 039) SS	Yuan (Type 039A) SS ^a	Qing SS	Annual total for all types shown	Cumulative total for all types shown	Cumulative total for modern attack boats ^c
1995			2 ^d	1				3	3	2
1996				1				1	4	2
1997				2				2	6	2
1998			1 ^d	2				3	9	3
1999			1 ^d		1			2	11	5
2000				1				1	12	5
2001				1	2			3	15	7
2002				1				1	16	7
2003					2			2	18	9
2004			1		3			4	22	13
2005			4		3			7	29	20
2006		1	3		2 ^e	1		7	36	27
2007	1	1 ^f						2	38	28
2008								0	38	28
2009						2		2	40	30
2010	1					1		2	42	31
2011						3	1 ^g	4	46	35
2012	1					5		6	51	40
2013	1					n/a	n/a	n/a	n/a	n/a
2014	1					n/a	n/a	n/a	n/a	n/a
2015						n/a	n/a	n/a	n/a	n/a
2016	1 ^h					n/a	n/a	n/a	n/a	n/a

Source: *Jane's Fighting Ships 2012-2013*, and previous editions.**Note:** n/a = data not available.

- a. Some observers believe the Yuan class to be a variant of the Song class and refer to the Yuan class as the Type 039A.
- b. Figures for Ming-class boats are when the boats were launched (i.e., put into the water for final construction). Actual commissioning dates for these boats may have been later.
- c. This total excludes the Jin-class SSBNs and the Ming-class SSs.
- d. *Jane's Fighting Ships 2012-2013* lists the commissioning date of one of the two Kilos as December 15, 1994.
- e. No further units expected after the 12th and 13th shown for 2006.
- f. *Jane's Fighting Ships 2012-2013* states that production of the two Shang-class boats shown in the table is expected to be followed by production of a new SSN design known as the Type 095 class, of which a total of five are expected. A graph on page 22 of *2009 ONI Report* (reprinted in this CRS report as **Figure 3**) suggests that ONI expects the first Type 095 to enter service in 2015.
- g. It is unclear whether this is the lead ship of a new class, or a one-of-a-kind submarine built for test purposes. *Jane's Fighting Ships 2012-2013* refers to the boat as an auxiliary submarine (SSA).
- h. A total of six Jin-class boats is expected by *Jane's*, with the sixth unit projected to be commissioned in 2016.

JL-2 SLBM on Jin-Class SSBN

Each Jin-class SSBN is expected to be armed with 12 JL-2 nuclear-armed submarine-launched ballistic missiles (SLBMs). DOD states that

The JIN-class SSBNs will eventually carry the JL-2 submarine-launched ballistic missile with an estimated range of 7,400 km [3,996 nautical miles]. The JIN-class and the JL-2 will give the PLA Navy its first long-range, sea-based nuclear capability. After a round of successful testing in 2012, the JL-2 appears ready to reach initial operational capability in 2013. JIN-class SSBNs based at Hainan Island in the South China Sea would then be able to conduct nuclear deterrence patrols.⁴⁸

Aircraft Carriers and Carrier-Based Aircraft⁴⁹

China in 2012 commissioned into service its first aircraft carrier—the *Liaoning* (**Figure 5**), a refurbished ex-Ukrainian aircraft carrier, previously named *Varyag*, that China purchased from Ukraine as an unfinished ship in 1998. China reportedly may also have begun building its first indigenous aircraft carrier.

Liaoning (Ex-Ukrainian Aircraft Carrier Varyag)

The *Liaoning*—named for the province containing Dalian, the city where the ship was refurbished—was commissioned into service on September 25, 2012, following a series of sea trials that began in August 2011.⁵⁰ In late February 2013, it was reported that the ship had been assigned a permanent home port at Qingdao, the home base of China's Northern Fleet.⁵¹

⁴⁸ 2013 DOD CMSD, p. 31. A range of 7,400 km could permit Jin-class SSBNs to attack

- targets in Alaska (except the Alaskan panhandle) from protected bastions close to China;
- targets in Hawaii (as well as targets in Alaska, except the Alaskan panhandle) from locations south of Japan;
- targets in the western half of the 48 contiguous states (as well as Hawaii and Alaska) from mid-ocean locations west of Hawaii; and
- targets in all 50 states from mid-ocean locations east of Hawaii.

See also Bill Gertz, "Red Tide: China Deploys New Class of Strategic Missile Submarines Next Year," *WashingtonTimes.com*, July 23, 2013, accessed August 8, 2013, at <http://www.washingtontimes.com/news/2013/jul/23/china-deploy-new-strategic-missile-class-submarine/?page=all>.

⁴⁹ China, according to one set of observers, initiated studies on possible aircraft carrier options in the 1990s, and approved a formal aircraft carrier program in 2004. (Andrew S. Erickson and Gabriel B. Collins, "The Calm Before the Storm," *FP [Foreign Policy] National Security* (www.foreignpolicy.com), September 26, 2012.) Another observer dates Chinese activities in support of an eventual aircraft carrier program back to the 1980s. (Torbjorg Hemmingsen, "PLAN For Action: New Dawn for Chinese Naval Aviation," *Jane's Navy International*, June 2012: 12-17.) Chinese officials have been talking openly since 2006 about eventually operating aircraft carriers. The August 2009 ONI report states on page 19 that "Beginning in early 2006, PRC-owned media has reported statements from high-level officials on China's intent to build aircraft carriers.")

⁵⁰ A June 13, 2013, press report states:

At least 15 Chinese were worked to death in response to leaders' orders to finish refurbishing the *Liaoning*, China's first aircraft carrier. A senior military engineer revealed the deaths in noting that the work was finished far ahead of schedule.

Wang Zhiguo, a systems engineer for the *Liaoning* project, disclosed the deaths in discussing statistics on the refurbishment in the May 31 online edition of *China Youth Daily*.

"The refurbishing project involved too much work to be done and we were given a very tight (continued...)"

Figure 5. Aircraft Carrier *Liaoning* (ex-Varyag)

Pictured at time of commissioning



Source: Picture posted at Foreign Policy.com, September 26, 2012.

The *Liaoning* has an estimated full load displacement of about 60,000 tons, and might accommodate an air wing of 30 or more aircraft, including short-takeoff, vertical landing (STOVL) fixed-wing airplanes and some helicopters. By comparison, a U.S. Navy aircraft carrier has a full load displacement of about 100,000 tons and can accommodate an air wing of 60 or more aircraft, including conventional takeoff and landing (CTOL) airplanes (which tend to have a greater range/payload than STVOL airplanes) and some helicopters.⁵²

(...continued)

deadline, which caused the deaths of my colleagues,” Mr. Wang said, expressing anguish over the loss.

He elaborated that the order came from Beijing that the carrier must be rebuilt in 30 months. But the home port for the carrier’s Ukraine-built shell was at Dalian in frigid northeastern China.

“We encountered the coldest freeze in 50 years, and many civic engineering projects involving the refurbishment were greatly affected by the cold weather, wasting a lot of time,” Mr. Wang said.

In the end, political leaders in Beijing refused to yield on extending the deadline, and all work was completed in 15 months.

(Miles Yu, “Inside China: Carrier’s Engineers Worked To Death,” *WashingtonTimes.com*, June 13, 2013.)

⁵¹ See, for example, Associated Press, “Reports: China Carrier Permanent Base Is Qingdao,” *ABC News* (<http://abcnews.com>), February 27, 2013.

⁵² For more on the *Liaoning*, see Paul M. Barrett, “China’s 65,000-Ton Secret,” *Bloomberg Businessweek*, January 30, 2012.

DOD states that “The PLA Navy successfully conducted its first launch and recovery of the carrier-capable J-15 fighter [from the *Liaoning*] on November 26, 2012. The *Liaoning* will continue integration testing and training with the aircraft during the next several years, but it is not expected to embark an operational air wing until 2015 or later.”⁵³ A July 4, 2013, press report states that “China’s first group of five pilots and landing signal officers received their certifications in the latest sea trials of the *Liaoning*....”⁵⁴ A May 16, 2013, press report stated:

It will take less time for China to learn how to effectively operate aircraft carriers than it took the U.S., the commander of the U.S. Navy’s Atlantic air arm, Rear Adm. Ted Branch said Wednesday.

“They will learn faster than we did and they will leverage our lessons,” Branch said during a panel at the at the EAST: Joint Warfighting 2013 symposium in Virginia Beach, Va....

But the PLAN will unlikely be proficient in carrier operations for several more years.

“They have the advantage of starting with more modern technology but it’s still a tough nut to crack to learn how to do this business,” Branch said.

“They still have a lot of learning to do before they have a viable capability.”⁵⁵

Indigenous Aircraft Carriers

DOD states that “China also continues to pursue an indigenous aircraft carrier program ... and will likely build multiple aircraft carriers over the next decade. The first Chinese-built carrier will likely be operational sometime in the second half of this decade.”⁵⁶ DOD also states that “Although reports have surfaced regarding the construction of a second Chinese aircraft carrier in Shanghai, the Chinese Ministry of National Defense has dismissed these claims.”⁵⁷ DOD stated in 2012 that “some components of China’s first indigenously-produced carrier may already be under construction.”⁵⁸

Press reports in August 2013 showed photographs of a ship section at a shipyard with features that led some observers to ask whether it was a section of China’s first indigenously built aircraft carrier.⁵⁹ Another set of observers interpreted the pictures as showing a demonstration module for validating construction techniques for building a new carrier, rather than an actual section of a new carrier.⁶⁰

⁵³ 2013 DOD CMSD, p. 6.

⁵⁴ Xinhua, “China’s Carrier-Borne Jet Pilots Receive Certification,” *People’s Daily Online*, July 4, 2013.

⁵⁵ “Admiral: China Will Likely Learn Carrier Ropes Faster than U.S.,” *USNI News* (<http://news.usni.org>), May 16, 2013. See also “China’s First Aircraft Carrier Advances With jet Take-Off Drills,” *Bloomberg.com*, July 4, 2013.

⁵⁶ 2013 DOD CMSD, p. 6.

⁵⁷ 2013 DOD CMSD, p. 56.

⁵⁸ 2012 DOD CMSD, p. 22.

⁵⁹ David Axe, “Is this China’s SECOND Aircraft Carrier?” *War is Boring*, August 1, 2013, accessed August 8, 2013, at <https://medium.com/war-is-boring/2a3fbfab3851>.

⁶⁰ Andrew S. Erickson and Gaber Collins, “China Carrier Demo Module Highlights Surging Navy,” *The National Interest*, August 6, 2013, accessed August 8, 2013, at <http://nationalinterest.org/commentary/china-carrier-demo-module-highlights-surging-navy-8842>.

In August 2013, a spokesman for China's Ministry of National Defense confirmed that China in the future will have other carriers in addition to the *Liaoning*.⁶¹ An April 23, 2013, press report similarly stated:

A senior officer with the People's Liberation Army (PLA) Navy said on Tuesday [April 23, 2013] that "China will have more than one aircraft carrier."

Song Xue, deputy chief of staff of the PLA Navy, told foreign military attaches at a ceremony to celebrate the Navy's 64th founding anniversary in Beijing, "The next aircraft carrier we need will be larger and carry more fighters."

However, Song said some foreign media reports on China's building new aircraft carriers in Shanghai were not accurate.⁶²

A November 30, 2012, press report states that China plans to build three indigenous carriers.⁶³ An August 28, 2012, press report states:

Reports in unofficial Chinese military blogs and websites say China planned to build these [indigenous] carriers at Jiangnan Shipyard's Chanxing Island shipbuilding base near Shanghai.

However, professional and amateur analysts who study satellite images of Chinese shipyards have been unable to find any evidence of construction.⁶⁴

A May 21, 2012, press report stated:

Taiwan's intelligence chief said May 21 that China plans to build two aircraft carriers, in addition to the first in its fleet, a refitted former Soviet carrier currently undergoing sea trials....

Tsai [Teh-sheng, head of the island's National Security Bureau,] said construction of the warships is slated to start in 2013 and 2015, respectively, with delivery dates of 2020 and 2022, and that they would be conventionally powered.⁶⁵

A July 11, 2013, press report stated, "A new carrier base is being built by the PLA Navy in Hainan province with the ability to harbor four aircraft carriers...."⁶⁶

Carrier-Based Aircraft

China reportedly was engaged in lengthy negotiations with Russia to purchase up to 50 Russian-made carrier-capable Su-33 fighter aircraft. Although the negotiations with Russia reportedly did

⁶¹ Xinhua, "China To Have More Aircraft Carriers: Ministry Spokesman," *People's Daily Online* (<http://english.peopledaily.com.cn>), August 29, 2013; Zhao Lei and Zhou Wa, "More Carriers Likely in China," *China Daily* (<http://usa.chinadaily.com.cn>), August 30, 2013.

⁶² "China's Second Aircraft Carrier Will Be 'Larger,'" *Xinhua*, April 23, 2013.

⁶³ Luo Yuan, "China Plans Four Carrier Strike Groups," *WantChinaTimes.com*, November 30, 2012.

⁶⁴ David Lague, "China's Aircraft Carrier: In Name Only," *Reuters.com*, August 28, 2012.

⁶⁵ Agence France-Presse, "China To Build 2 More Aircraft Carriers: Taiwan," *DefenseNews.com*, May 21, 2012.

⁶⁶ "PLA Building New Carrier Base in Hainan: Kanwa," *WantChinaTimes.com*, July 11, 2013, accessed August 8, 2013, at <http://www.wantchinatimes.com/news-subclass-cnt.aspx?id=20130711000087&cid=1101>.

not lead to a purchase of Su-33s, China has developed its own carrier-capable fighter, called the J-15 or Flying Shark, which reportedly is based on the Su-33.⁶⁷ Some observers believe China may also develop a carrier-based version of its new J-31 stealth fighter prototype, which outwardly resembles the U.S. F-35 Joint Strike Fighter (JSF).⁶⁸ DOD states that

The J-15 aircraft conducted its first takeoffs and landings from the Liaoning on November 26, 2012. Subsequently, at least two aircraft conducted multiple landings and takeoffs from the ship. The J-15 carrier-based fighter is the Chinese version of the Russian Su-33. The J-15 is designed for ski-jump takeoffs and arrested landings, as required by the configuration of the Liaoning. Although the J-15 has a land-based combat radius of 1200 km, the aircraft will be limited in range and armament when operating from the carrier, due to limits imposed by the ski-jump takeoff and arrested carrier landings.⁶⁹

A May 10, 2013, press report states that

A carrier-borne aviation force has been formally established as part of the People's Liberation Army (PLA) Navy, military sources said on Friday [May 10].

The forming of the force, approved by the Central Military Commission (CMC), demonstrates that the development of China's aircraft carriers has entered a new phase, the sources said.

The force comprises carrier-borne fighter jets, jet trainers and ship-borne helicopters that operate anti-submarine, rescue and vigilance tasks.⁷⁰

Potential Roles, Missions, and Strategic Significance

Although aircraft carriers might have some value for China in Taiwan-related conflict scenarios, they are not considered critical for Chinese operations in such scenarios, because Taiwan is within range of land-based Chinese aircraft. Consequently, most observers believe that China is acquiring carriers primarily for their value in other kinds of operations, and to symbolize China's status as a major world power. DOD stated in 2011 that "Given the fact that Taiwan can be reached by land-based aviation, China's aircraft carrier program would offer very limited value in

⁶⁷ 2011 DOD CMSD, p. 46. See also Reuben F. Johnson, "Images Suggest Shenyang Making Progress on Carrier-Capable J-15," *Jane's Navy International*, March 2012: 11; David Axe, "The Limits Of China's Fighter," *The Diplomat* (the-diplomat.com), July 15, 2011; Gabe Collins and Andrew Erickson, "China's J-15 No Game Changer," *The Diplomat* (<http://the-diplomat.com>), June 23, 2011; Andrew Erickson and Gabe Collins, "'Flying Shark' Gaining Altitude: How might new J-15 strike fighter improve China's maritime air warfare ability?" *China SignPost*, June 7, 2011, 11 pp.; Wendell Minnick, "China Confirms J-15 Carrier-Based Fighter; Aircraft Based on Russian-Designed Su-33," *Defense News*, May 2, 2011: 4; David A. Fulghum, "New Chinese Ship-Based Fighter Progresses," *Aviation Week & Space Technology*, April 28, 2011; David A. Fulghum, "New Chinese Ship-Based Heavy Fighter Readied For Flight Tests," *Aerospace Daily & Defense Report*, April 27, 2011: 1-2; Michael Wines, "Chinese State Media, In A Show Of Openness, Print Jet Photos," *New York Times*, April 26, 2011: 4.

⁶⁸ John Reed, "China's Second Stealth Jet May Be A Carrier Fighter," *FP [Foreign Policy] National Security*, March 11, 2013, accessed April 26, 2013, at http://killerapps.foreignpolicy.com/posts/2013/03/11/chinas_second_stealth_jet_may_be_a_carrier_fighter. See also "J-31 May Become China's Next Generation Carrier-Borne Fighter Jet," *Global Times*, March 6, 2013.

⁶⁹ 2013 DOD CMSD, pp. 65-66.

⁷⁰ "China's Navy Forms 1st Carrier-Borne Jet Force," *Xinhua*, May 10, 2013, accessed May 17, 2013, at http://news.xinhuanet.com/english/china/2013-05/10/c_132373868.htm.

a Taiwan scenario and would require additional naval resources for protection. However, it would enable China to extend its naval air capabilities elsewhere.”⁷¹

Chinese aircraft carriers could be used for power-projection operations, particularly in scenarios that do not involve opposing U.S. forces. Chinese aircraft carriers could also be used for humanitarian assistance and disaster relief (HA/DR) operations, maritime security operations (such as anti-piracy operations), and non-combatant evacuation operations (NEOs). Politically, aircraft carriers could be particularly valuable to China for projecting an image of China as a major world power, because aircraft carriers are viewed by many as symbols of major world power status. In a combat situation involving opposing U.S. naval and air forces, Chinese aircraft carriers would be highly vulnerable to attack by U.S. ships and aircraft, but conducting such attacks could divert U.S. ships and aircraft from performing other missions in a conflict situation with China.⁷²

DOD states that the *Liaoning*

most likely will conduct extensive local operations focusing on shipboard training, carrier aircraft integration, and carrier formation training before reaching an operational effectiveness in three to four years. The carrier could operate in the East and South China Seas in the nearer term and may be used for other mission sets as needed.

The carrier will most likely be based at Yuchi in the Qingdao area in the near term, although Sanya Naval Base on Hainan Island is also a possibility, particularly after an operational air wing is formed. The base under construction at Yuchi features a deep draft harbor with replenishment, repair, and maintenance facilities. The Qingdao area also supports nearby airfields for aircraft maintenance and repair.⁷³

Some observers have referred to the *Liaoning* as China’s “starter” carrier.⁷⁴

Surface Combatants

China since the early 1990s has purchased four Sovremenny-class destroyers from Russia and put into service 10 new classes of indigenously built destroyers and frigates (some of which are variations of one another) that demonstrate a significant modernization of PLA Navy surface combatant technology. DOD states: “Since 2008, the PLA Navy has embarked on a robust surface combatant construction program of various classes of ships, including guided missile destroyers (DDG[s]) and guided missile frigates (FFG[s]). During 2012, China continued series production of several classes, including construction of a new generation of DDG[s].”⁷⁵ DOD states that China’s new destroyers and frigates “provide a significant upgrade to the PLA Navy’s area air

⁷¹ 2011 DOD CMSD, p. 38.

⁷² For further discussion, see Andrew Erickson and Gabe Collins, “The ‘Flying Shark’ Prepares to Roam the Seas: pros and cons [for China] of China’s aircraft carrier program,” *China SignPost*, May 18, 2011, 5 pp.; Aaron Shraberg, “Near-Term Missions for China’s Maiden Aircraft Carrier,” *China Brief*, June 17, 2011: 4-6; and Andrew S. Erickson, Abraham M. Denmark, and Gabriel Collins, “Beijing’s ‘Starter Carrier’ and Future Steps,” *Naval War College Review*, Winter 2012: 15-55.

⁷³ 2013 DOD CMSD, p. 65.

⁷⁴ See, for example, “China Plans New Generation of Carriers as Sea Disputes Grow,” *Bloomberg News*, April 24, 2013.

⁷⁵ 2013 DOD CMSD, p. 7.

defense capability, which will be critical as it expands operations into ‘distant seas’ beyond the range of shore-based air defense.”⁷⁶ China reportedly is also building a new class of corvettes (i.e., light frigates) and has put into service a new kind of missile-armed fast attack craft that uses a stealthy catamaran hull design. One observer states that

2011 was the start of a new wave of shipbuilding for PLAN. This trend only accelerated into this year [2012]. Most of the major Chinese naval shipyards have been very busy with naval and civilian maritime ministry orders in the past year. Part of this could be the downturn in the world’s shipbuilding market, but an even larger part is that the time has come for this second wave of PLAN modernization (the first being from 2003 to 2006). JiangNan shipyard has been leading the way with 8 [Type] 052C/D ships [destroyers] in various stages of completion before commissioning along with construction of [Type] 039B submarines and Minesweepers. HuDong shipyard has continued its work with at least 3 [Type] 054A frigates along with Type 903 AOR [resupply ships] and multiple [Type] 056 patrol ships. Huangpu shipyard is finishing up on its [Type] 054A [frigate] orders, but is building numerous [Type] 056 patrol ships, small specialty naval ships and cutters for different maritime agencies. One of the prominent sightings at HP shipyard is the number of rescue ships and CMS [China Maritime Surveillance agency maritime law enforcement] ships that are in various stages of completion. Wuchang shipyard also has its shares of cutters along with [Type] 039B submarines and [Type] 056 patrol ships. Even the smaller shipyards around the country have been getting many orders for auxiliary ships, smaller combat ships and rescue ship/cutters for civilian ministry. The only one that seems to not be getting much work right now is Dalian shipyard. Going forward, this heavy construction activity should continue into next year with JN, HD and HP shipyard continue being the largest naval shipyards in the country.⁷⁷

Sovremenny-Class Destroyers

China in 1996 ordered two Sovremenny-class destroyers from Russia; the ships entered service in 1999 and 2001. China in 2002 ordered two additional Sovremenny-class destroyers from Russia; the ships entered service in 2005 and 2006. Sovremenny-class destroyers are equipped with the Russian-made SS-N-22 Sunburn ASCM, a highly capable ASCM.

Six New Indigenously Built Destroyer Classes

China since the early 1990s has put into service six new classes of indigenously built destroyers, two of which are variations of another. The classes are called the Luhu (Type 052), Luhai (Type 051B), Luyang I (Type 052B), Luyang II (Type 052C), the Luyang III (Type 052D), and Louzhou (Type 051C) designs. Compared to China’s remaining older Luda (Type 051) class destroyers, which entered service between 1971 and 1991, these six new indigenously built destroyer classes are substantially more modern in terms of their hull designs, propulsion systems, sensors, weapons, and electronics. The Luyang II-class ships (**Figure 6**) and the Luyang III-class ships appear to feature phased-array radars that are outwardly somewhat similar to the SPY-1 radar used in the U.S.-made Aegis combat system.⁷⁸ Like the older Luda-class destroyers, these six new destroyer classes are armed with ASCMs.

⁷⁶ 2013 DOD CMSD, p. 7.

⁷⁷ Blog entry entitled “2012 in Review,” December 28, 2012, accessed March 21, 2013 at <http://www.informationdissemination.net/2012/12/2012-in-review.html>.

⁷⁸ 2009 ONI Report, p. 1.

Figure 6. Luyang II (Type 052C) Class Destroyer



Source: Photograph provided to CRS by Navy Office of Legislative Affairs, December 2010.

As shown in **Table 2**, China between 1994 and 2007 commissioned only one or two ships in its first four new indigenously built destroyers classes, suggesting that these classes were intended as stepping stones in a plan to modernize the PLA Navy's destroyer technology incrementally before committing to larger-scale series production of Luyang II-class destroyers. As also shown in **Table 2**, after commissioning no new destroyers in 2008-2011, commissionings of new Luyang II-class destroyers appear to have resumed. Regarding the 2008-2011 gap in commissionings, one observer states, "The relocation of JiangNan shipyard and indigenization of DA80/DN80 gas turbine (QC-280) delayed the production of follow-on units [of Luyang II-class destroyers] for several years."⁷⁹

⁷⁹ Blog entry entitled "2012 in Review," December 28, 2012, accessed March 21, 2013 at <http://www.informationdissemination.net/2012/12/2012-in-review.html>.

Table 2. PLA Navy Destroyer Commissionings

Actual (1994-2011) and Projected (2012-2014)

	Sovremenny (Russian-made)	Luhu (Type 052)	Luhai (Type 051B)	Luyang I (Type 052B)	Lyugang II (Type 052C)	Louzhou (Type 051C)	Luyang III (Type 052D)	Annual total	Cumulative total
1994		1						1	1
1995								0	1
1996		1						1	2
1997								0	2
1998								0	2
1999	1		1					2	4
2000								0	4
2001	1							1	5
2002								0	5
2003								0	5
2004				2	1			3	8
2005	1				1			2	10
2006	1					1		2	12
2007						1		1	13
2008								0	13
2009								0	13
2010								0	13
2011								0	13
2012					1			1	14
2013					2			2	16
2014					1		n/a	n/a	n/a

Source: Jane's Fighting Ships 2012-2013, and previous editions.

DOD states that

Construction of the LUYANG II-class DDG[s] (Type 052C) continued, with one ship entering service in 2012, and an additional three ships under various stages of construction and sea trials, bringing the total number of ships of this class to six by the end of 2013. Additionally, China launched the lead ship in a follow-on class, the LUYANG III- class DDG (Type 052D), which will likely enter service in 2014. The LUYANG III incorporates the PLA Navy's first multipurpose vertical launch system, likely capable of launching ASCM, land attack cruise missiles (LACM), surface-to-air missiles (SAM), and anti-submarine rockets. China is projected to build more than a dozen of these ships to replace its aging LUDA-class destroyers (DD[s]).⁸⁰

Four New Indigenously Built Frigate Classes

China since the early 1990s has put into service four new classes of indigenously built frigates, two of which are variations of two others. The classes are called the Jiangwei I (Type 053 H2G),

⁸⁰ 2103 DOD CMSD, p. 7.

Jiangwei II (Type 053H3), Jiangkai I (Type 054), and Jiangkai II (Type 054A) designs. Compared to China's remaining older Jianghu (Type 053) class frigates, which entered service between the mid-1970s and 1989, the four new frigate classes feature improved hull designs and systems, including improved AAW capabilities. As shown in **Table 3**, production of Jiangkai II-class ships (**Figure 7**) continues, and *Jane's* projects an eventual total of at least 16.

Figure 7. Jiangkai II (Type 054A) Class Frigate



Source: Photograph provided to CRS by Navy Office of Legislative Affairs, December 2010.

DOD states that “China has continued the construction of the workhorse JIANGKAI II-class FFG[s] (Type 054A), with 12 ships currently in the fleet and six or more in various stages of construction, and yet more expected.”⁸¹

⁸¹ 2013 DOD CMSD, p. 7.

Table 3. PLA Navy Frigate Commissionings

Actual (1991-2011) and Projected (2012-2013)

	Jiangwei I (Type 053 H2G)	Jiangwei II (Type 053H3)	Jiangkai I (Type 054)	Jiangkai II (Type 054A)	Annual total	Cumulative total
1991	1				1	1
1992	1				1	2
1993	1				1	3
1994	1				1	4
1995					0	4
1996					0	4
1997					0	4
1998		1			1	5
1999		4			4	9
2000		1			1	10
2001					0	10
2002		2			2	12
2003					0	12
2004					0	12
2005		2	1		3	15
2006			1		1	16
2007					0	16
2008				4	4	20
2009					0	20
2010				3	3	23
2011				2	2	25
2012				2	2	27
2013				5	5	32

Source: Jane's Fighting Ships 2012-2013, and previous editions.

Type 056 Corvette

China is building a new type of corvette (i.e., a light frigate, or FFL) called the Jiangdao class or Type 056 (**Figure 8**). DOD states that “At least six of the JIANGDAO-class corvettes (FFL[s]) (Type 056) were launched in 2012. The first of these ships entered service on February 25, 2013; China may build 20 to 30 of this class.”⁸²

⁸² 2013 DOD CMSD, p. 7

Figure 8. Type 056 Corvette

Shown under construction



Source: Blog entry entitled “PLAN’s New Type 056 Class,” August 12, 2012, accessed October 12, 2012, at <http://www.informationdissemination.net/2012/08/plans-new-type-056-class.html>.

One observer states,

The first [Type] 056 class [with hull number] No. 582 was officially handed over to PLAN on the 25th of February [2013] as Wu Shengli, Commander of PLAN personally came to inspect the ship. While it is referred to as light frigate by Chinese news, it really should be classified as a corvette or OPV [offshore patrol vessel] based on its size and displacements. This class is expected to be the next mass produced PLAN shipping class.

The type 056 class fills the gap [in ship sizes] between the 4000-ton [Type] 054A class frigate and 220-ton [Type] 022 class FAC [fast attack craft]. As of now, at least 9 other [Type] 056s have already been launched by the 4 shipyards building them. The overall number of this class is expected to be between the final count of [Type] 054A [ships] (probably around 20) and [Type] 022 [craft] (around 80). They are expected to replace the 10 Type 053 class Jianghu frigates currently serving in the South China Sea Patrol flotilla and the close to 50 Type 037 class missile boats.

In many ways, the type 056 hull is based on the Pattani class OPV that China built for Thailand from 2005 to 2006, although more signature reduction work is done such as the shielding of the funnels.⁸³

This same observer stated earlier that:

⁸³ Blog entry entitled “China’s New Type 056,” March 12, 2013, accessed March 21, 2013, at <http://www.informationdissemination.net/2013/03/chinas-new-type-056.html>.

The [Type] 056 program seems to follow an even more aggressive production schedule than [Type] 022 FACs [fast attack craft]. We are seeing four shipyards (HuDong, HuangPu, WuChang and LiaoNan) producing [Type] 056s simultaneously before the first [Type] 056 was ever launched. In fact, the first [Type] 056 launched from both HP and HD shipyard had their funnels and the bow section reworked after they were already launched.⁸⁴

Houbei (Type 022) Fast Attack Craft

As an apparent replacement for at least some of its older fast attack craft, or FACs (including some armed with ASCMs), China in 2004 introduced a new type of ASCM-armed fast attack craft, called the Houbei (Type 022) class (**Figure 9**), that uses a stealthy, wave-piercing, catamaran hull.⁸⁵ Each boat can carry eight C-802 ASCMs. The August 2009 ONI report states that “the Houbei’s ability to patrol coastal and littoral waters and react at short notice allows the PLA(N)’s larger combatants to focus on offshore defense and out-of-[home]area missions without leaving a security gap along China’s coastline.”⁸⁶ The Houbei class was built in at least six shipyards; construction of the design appeared to stop in 2009 after a production run of about 60 units.

Figure 9. Houbei (Type 022) Class Fast Attack Craft

With an older Luda-class destroyer behind



Source: Photograph provided to CRS by Navy Office of Legislative Affairs, December 2010.

⁸⁴ Blog entry entitled “2012 in Review,” December 28, 2012, accessed March 21, 2013 at <http://www.informationdissemination.net/2012/12/2012-in-review.html>.

⁸⁵ For an article discussing how the Type 022 design appears to have been derived from the designs of Australian high-speed ferries, see David Lague, “Insight: From a Ferry, a Chinese Fast-Attack Boat,” *Reuters*, June 1, 2012.

⁸⁶ *2009 ONI Report*, p. 20. For further discussion of the Houbei class, see John Patch, “A Thoroughbred Ship-Killer,” *U.S. Naval Institute Proceedings*, April 2010: 48-53.

Surface Ships Operated by Non-PLAN Maritime Law Enforcement Agencies

In addition to the PLAN surface combatants discussed above, China operates numerous additional surface ships in maritime law enforcement (MLE) agencies that are outside the PLAN. China in 2013 consolidated four of its six MLE agencies into a new China Coast Guard (CCG); the other two MLE agencies continue to operate separate from the new CCG.

China often uses MLE ships, rather than PLAN ships, to assert and defend its maritime territorial claims and fishing interests in the South China Sea and East China Sea. While China's MLE ships are often unarmed or lightly armed, they can nevertheless be effective in confrontations with unarmed fishing vessels or other ships. China is rapidly modernizing its inventory of MLE ships, and some of China's newest MLE ships are relatively large.

One set of observers, citing data provided by ONI and DOD, among other sources, states:

China previously had six chief Maritime Law Enforcement (MLE) agencies, all with separate and sometimes overlapping missions. In June 2013, China officially consolidated four of these six agencies into the new China Coast Guard⁸⁷ in an effort to address longstanding shortcomings in its coordination of maritime policy and centralize control of China's MLE operations.

China's MLE agencies altogether operate approximately 110 ocean-going ships and 1,050 patrol craft and smaller boats. While most of these ships previously were unarmed, those subordinated to the China Coast Guard under the new structure might now be authorized to carry light weapons. Furthermore, China's MLE force, like the PLA Navy, is in the midst of a modernization program and by 2015 will introduce at least 30 new ocean-going ships and more than 100 smaller patrol boats. Most of these units will be larger and more capable than previous ones, and some will have the ability to embark helicopters. MLE agencies also will continue to acquire decommissioned ships from the PLA Navy—a practice that has increased in recent years.⁸⁸

DOD states that

In the next decade, an expanded and modernized force of civilian maritime ships will afford China the capability to more robustly patrol its territorial claims in the ECS [East China Sea] and SCS [South China Sea]. China is continuing with the second half of a modernization and construction program for its maritime law enforcement agencies. The first half of this program, from 2004-2008, resulted in the addition of almost 20 ocean-going patrol ships for the CMS (9), Bureau of Fisheries (BOF) (3), Maritime Safety Administration (MSA) (3), and China Coast Guard (2). The second half of this program, from 2011-2015, includes at least 30 new ships for the CMS (23), BOF (6), and MSA (1). Several agencies have also acquired ships that were decommissioned from the PLA Navy. Some old patrol ships will be decommissioned during this period. In addition, MLE [maritime law enforcement] agencies will likely build more than 100 new patrol craft and smaller units, both to increase capability and to replace old units. Overall, CMS total force level is expected to increase 50 percent by

⁸⁷ The passage includes a footnote at this point, which states: "The former six chief MLE agencies were China Maritime Surveillance, Fisheries Law Enforcement Command, China Coast Guard, Maritime Customs Service, Maritime Safety Administration, and China Rescue and Salvage. China consolidated the assets of all but the Maritime Safety Administration and China Rescue and Salvage into the new China Coast Guard."

⁸⁸ Craig Murray, Andrew Berglund, and Kimberly Hsu, *China's Naval Modernization and Implications for the United States*, U.S.-China Economic and Security Review Commission (USCC), August 26, 2013, p. 7.

2020 and BOF by 25 percent. MSA, China Coast Guard, and Maritime Customs force levels will probably remain constant, but with larger and more capable units replacing older, smaller units. Some of these ships will have the capability to embark helicopters, a capability that only a few MLE ships currently have. The enlargement and modernization of China's MLE forces will improve China's ability to enforce its maritime sovereignty.⁸⁹

Figure 10 shows a picture of a Chinese maritime patrol ship called Haixun 01.

Figure 10. Haixun 01 Maritime Patrol Ship



Source: "Chinese Patrol Vessel to Exercise with USCG in Hawaii," Chuck Hill's CG [Coast Guard] Blog, August 26, 2012, accessed online on October 11, 2012, at <http://chuckhillscgblog.net/2012/08/26/chinas-largest-patrol-vessel-to-exercise-with-uscg-in-hawaii/>.

Amphibious Ships

Yuzhao (Type 071) Amphibious Ship

China has put into service a new class of amphibious ships called the *Yuzhao* or *Type 071 class* (**Figure 11**). The lead ship in the class entered service in 2007 and was deployed as part of one of China's anti-piracy patrols off Somalia. DOD states that the second and third ships in the class entered service in 2012.⁹⁰ A fourth ship in the class reportedly has been launched.⁹¹

⁸⁹ 2013 DOD CMSD, p. 40. See also Trefor Moss, "China's Other Navies," *Jane's Defence Weekly*, July 11, 2012: 28-29, 31-32; blog entry entitled "China's Recent Expansion of the Maritime Agencies," January 20, 2013, accessed March 21, 2013, at <http://www.informationdissemination.net/2013/01/chinas-recent-expansion-of-maritime.html>; Lyle J. Goldstein, *Five Dragons Stirring Up the Sea, Challenge and Opportunity in China's Improving Maritime Enforcement Capabilities*, Newport (RI), Naval War College, China Maritime Studies Institute, China Maritime Study Number 5, April 2010, 39 pp.; and *Jane's Fighting Ships 2012-2013*, pp. 166-167.

⁹⁰ 2013 DOD CMSD, pp. 7-8.

Figure 11. Yuzhao (Type 071) Class Amphibious Ship

With two Houbei (Type 022) fast attack craft behind



Source: Photograph provided to CRS by Navy Office of Legislative Affairs, December 2010.

The Type 071 design has an estimated displacement of 17,600 tons, compared with about 15,900 tons to 16,700 tons for the U.S. Navy's Whidbey Island/Harpers Ferry (LSD-41/49) class amphibious ships, which were commissioned into service between 1985 and 1998, and about 25,900 tons for the U.S. Navy's new San Antonio (LPD-17) class amphibious ships, the first of which was commissioned into service in 2006.

Reported Potential Type 081 Amphibious Ship

China reportedly has begun construction of a larger amphibious ship, called the Type 081 LHD.⁹² Earlier sources stated that the ship might displace about 20,000 tons;⁹³ a more recent report states that it might displace 35,000 tons.⁹⁴ By comparison, U.S. Navy LHD/LHA-type amphibious

(...continued)

⁹¹ Sources: Blog entry entitled "Latest activity at HD shipyard," dated September 27, 2011, accessed online at <http://www.informationdissemination.net/2011/09/latest-activity-at-hd-shipyard.html>; and "Fourth Chinese Navy Type 071 LPD Launched at Shanghai Shipyard," January 28, 2012, accessed online at http://www.navyrecognition.com/index.php?option=com_content&task=view&id=301 (a similar item, also dated January 28, 2012, was accessed online at <http://nosint.blogspot.com/2012/01/fourth-chinese-navy-type-071-lpd.html>). See also David Lague, "New China Landing Vessels Point To Pacific Rivalry," *Reuters.com*, February 14, 2012. See also the blog entry entitled "Recent Activities Around Chinese Shipyards," April 22, 2012, accessed July 31, 2012, at <http://www.informationdissemination.net/2012/04/recent-acitivites-around-chinese.html>. (Note the spelling of "acitivites" in the URL.)

⁹² Kyodo News International, "China Building 1st Amphibious Assault Ship in Shanghai," *GlobalPost* (www.globalpost.com), August 26, 2013.

⁹³ See, for example, *Jane's Fighting Ships 2012-2013*, p. 152.

⁹⁴ Kyodo News International, "China Building 1st Amphibious Assault Ship in Shanghai," *GlobalPost* (continued...)

assault ships displace 41,000 to 45,000 tons. Some observers believe China may build a total of three or more Type 081s. DOD states that “China will also begin construction on a new Type 081-class landing helicopter assault ship within the next five years.”⁹⁵ Figure 12 shows an unconfirmed conceptual rendering of a possible design for the Type 081 LHD.

Figure 12. Type 081 LHD (Unconfirmed Conceptual Rendering of a Possible Design)



Source: Global Times Forum, accessed July 31, 2012, at <http://forum.globaltimes.cn/forum/showthread.php?p=72083>.

A March 28, 2012, press report states:

China Shipbuilding Corporation (CSC) has revealed what may be a design for the Type 081 landing helicopter dock (LHD) amphibious assault ship.

The design was shown in model form at the Defense & Security 2012 exhibition in Bangkok in early March. It is unclear whether this is the Type 081 LHD design long expected to complement the People's Liberation Army (PLA) Navy's Type 071 land platform dock (LPD) vessels, the third of which was launched in September 2011. However, China did reveal a model of the Type 071 in 2004 ahead of the first-in-class vessel's launch in December 2006.

(...continued)

(www.globalpost.com), August 26, 2013.

⁹⁵ 2013 DOD CMSD, p. 39.

According to Taiwanese defence magazine *DTM*, which supplied images of the model to *IHS Jane's*, the proposed LHD has a length of 211 m [i.e., about 692.25 feet], [a] maximum speed of 23 kt and can embark eight helicopters with hangar space for four. Endurance is 25-30 days at sea and accommodation is provided for 1,068 embarked marines, officials said....

Any resemblance to the French Mistral [LHD] design may reflect comments by the late General/Admiral Liu Huaqing, the architect of the PLA's modernisation path, who in his memoirs confirmed co-operation with French naval design institutes.⁹⁶

Potential Roles for Type 071 and Type 081 Ships

Although larger amphibious ships such as the Type 071 and the Type 081 would be of value for conducting amphibious landings in Taiwan-related conflict scenarios, some observers believe that China is building such ships more for their value in conducting other kinds of operations that are more distant from China's shores. Larger amphibious ships can be used for conducting not only amphibious landings, but humanitarian assistance and disaster relief (HA/DR) operations, maritime security operations (such as anti-piracy operations), and non-combatant evacuation operations (NEOs). Some countries are acquiring larger amphibious ships as much, or more, for these kinds of operations as for conducting amphibious landings.⁹⁷ Politically, larger amphibious ships can also be used for naval diplomacy (i.e., port calls and engagement activities).

DOD states that "The PLA Navy currently lacks the massive amphibious lift capability that a large-scale invasion of Taiwan would require,"⁹⁸ and that "China does not appear to be building the conventional amphibious lift required to support such a campaign."⁹⁹

Air Cushioned Landing Craft

In June 2013, it was reported that China in May 2013 had taken delivery of four large, Ukrainian-made air-cushioned landing craft (LCACs). The craft reportedly have a range of 300 nautical miles, a maximum speed of 63 knots, and a payload capacity of 150 tons. Some experts reportedly discounted the operational utility of the LCACs, describing them as "giant toys."¹⁰⁰

Reported Dual-Use Ferry and Cruise Ship

An August 31, 2012, blog entry stated that

China's newest addition to its military is ... a 36,000-ton pleasure boat capable of disgorging thousands of troops and hundreds of vehicles held inside its belly.

⁹⁶ Ted Parsons, "Chinese Shipbuilder Unveils Possible Type 081 LHD Design," *Jane's Defence Weekly*, March 28, 2012: 15. The article includes a photo of a model of a Type 081 design that appears similar to the design shown in **Figure 12**. See also "New Chinese Ship Causes Alarm," *Taipei Times*, May 31, 2012: 1.

⁹⁷ See, for example, Richard Scott, "Power Projectors," *Jane's Defence Weekly*, July 27, 2011: 21-24, 26-28.

⁹⁸ 2013 DOD CMSD, p. 58.

⁹⁹ 2013 DOD CMSD, p. 57.

¹⁰⁰ Minnie Chan, "Experts Dismiss PLA Navy's Landing Craft From Ukraine as Giant Toys," *South China Morning Post*, June 25, 2013.

That would be the *Bahai Sea Green Pearl*, a 36,000-ton ferry and cruise ship commissioned in August at Yantai Port in China's northeastern Shandong Province. At heart a vessel for pleasure and civilian transport, the ship is intended to normally ferry cars and passengers across the Yellow Sea. But when needed by the People's Liberation Army, the Green Pearl can double as a troop carrier. During its launching ceremony and demonstration on Aug. 8, PLA troops could be seen loading dozens of tanks, artillery pieces and armored vehicles on board....

China also has three more of the vessels under construction, which Zhang Wei, chief of the PLA's Military Transportation Department under the PLA General Logistics Department, said is a "new leap in our military use of civilian vessels to improve the strategic projection." The Green Pearl reportedly has room for more than 2,000 people and 300 cars. It's even got a helicopter pad....

However, the *Green Pearl* is by no means a true amphibious assault ship. There's no indication of any landing craft, or any ability to launch them. The ship needs a proper dock to get its heavier equipment onto land. That mostly rules out launching an invasion of troops while sitting (relatively) safely off-shore. Instead, the ship is more accurately called something like an "amphibious augmentation" platform. It can base a helicopter, and it can follow up an amphibious assault with more troops—after a landing site is secure.

It's also not a new concept. Using civilian ships for double duty is "entirely in keeping with Chinese practices reaching back for centuries," Jim Holmes, an associate professor of strategy at the Navy War College, tells *Danger Room*. For Western navies, that practice dated up until the 18th century. And today, the U.S. uses mixed military and commercial ships to refuel at sea, Holmes says....

What's more likely is using the Green Pearl for "soft power" operations distant from China's shores. "Beijing seems rather comfortable with the situation in the Taiwan Strait and is clearly looking beyond Taiwan, as it has been for some time now," Holmes says. "Such a vessel could be a workhorse for any mission involving amphibious operations, meaning humanitarian relief."

That could mean delivering aid, transporting doctors and engineers to a country beset by an emergency. And there's always port calls. That is, making stops in countries friendly to China while carrying a contingent of visiting officers and diplomats on board.¹⁰¹

Land-Based Aircraft and Unmanned Aerial Vehicles (UAVs)

Land-Based Aircraft

China has introduced modern land-based fighters and strike fighters into the PLA Air Force and PLA Naval Air Force. These include Russian-made Su-27s and Su-30s and indigenously produced J-10s and J-11s. At least some of the strike fighters are or will be armed with modern ASCMs. China's land-based naval aircraft inventory includes, among other things, 24 Russian-made Su-30 MKK 2 Flanker land-based fighters, whose delivery was completed in 2004. The Su-30 is a derivative of the Su-27. Some of the Su-30s might eventually be fitted with the Russian-made AS-17A/B ASCM. (China's air force operates at least 150 Su-27s; these aircraft could be

¹⁰¹ Robert Beckhusen, "China Now Using A Cruise Ship To Haul Troops And Tanks," *Danger Room (Wired.com)*, August 31, 2012.

used for fleet-defense operations.) China's navy also operates 100 ASCM-armed JH-7 land-based fighter-bombers that were delivered between 1998 and 2004, and older ASCM-armed land-based maritime bombers.

China in January 2011 reportedly began testing a stealthy, land-based, fighter-type aircraft, called the J-20. Some observers believe, based on the aircraft's size and design, that it might be intended as a land-based strike aircraft for attacking ships at sea.¹⁰²

China in June 2012 reportedly reached agreement with Russia to license-produce long-range TU-22 Backfire bombers; the planned force of 36 Backfires would be armed with ASCMs.¹⁰³

UAVs

DOD states that "acquisition and development of longer-range unmanned aerial vehicles (UAV[s]), including the BZK-005, and unmanned combat aerial vehicles (UCAV[s]), will increase China's ability to conduct long-range reconnaissance and strike operations."¹⁰⁴ The August 2009 ONI report states that "China is developing UAVs that have the potential to bring multimission capabilities to the maritime environment. In recent years, Chinese officials have openly touted the benefits of UAVs, such as low manufacturing costs, lack of personnel casualties, and inherent 'stealth-like' characteristics."¹⁰⁵

Nuclear and Electromagnetic Pulse (EMP) Weapons

A July 22, 2011, press report states that "China's military is developing electromagnetic pulse weapons that Beijing plans to use against U.S. aircraft carriers in any future conflict over Taiwan, according to an intelligence report made public on Thursday [July 21].... The report, produced in 2005 and once labeled 'secret,' stated that Chinese military writings have discussed building low-yield EMP warheads, but 'it is not known whether [the Chinese] have actually done so.'"¹⁰⁶

¹⁰² See, Bill Sweetman, "Chinese J-20 Stealth Fighter In Taxi Tests," *AviationWeek.com*, January 3, 2011; Jeremy Page, "A Chinese Stealth Challenge," *Wall Street Journal*, January 5, 2011: 1; Phil Stewart, "U.S. Downplays Chinese Stealth Fighter Status," *Reuters.com*, January 5, 2011; Agence France-Presse, "US Downplays Concern Over Chinese Stealth Fighter," *DefenseNews.com*, January 6, 2011; Tony Capaccio, "China's J-20 Stealth Fighter Meant to Counter F-22, F-35, U.S. Navy Says," *Bloomberg.com*, January 6, 2011; David A. Fulgham, et al, "Stealth Slayer?" *Aviation Week & Space Technology*, January 17, 2011: 20-21, Andrew S. Erickson and Gabriel B. Collins, "China's New Project 718/J-20 Fighter: Development outlook and strategic implications," *China SignPost*, January 17, 2011, 13 pp.; Dave Majumdar, "U.S. Opinions Vary Over China's Stealthy J-20," *Defense News*, January 24, 2011: 16; Stephen Trimble, "J-20: China's Ultimate Aircraft Carrier-Killer?" *The DEW Line* (www.flightglobal.com), February 9, 2011; Carlo Kopp, "An Initial Assessment of China's J-20 Stealth Fighter," *China Brief*, May 6, 2011: 9-11; David Axe, "Stealth Fighter or Bomber?" *The Diplomat* (<http://the-diplomat.com>), July 26, 2011; Bill Sweetman, "Chinese J-20 Stealth Fighter Advances," *Aviation Week Defense Technology International*, January 31, 2012.

¹⁰³ Norman Friedman, "Back(fire) to the Future," *U.S. Naval Institute Proceedings*, August 2012: 90-91.

¹⁰⁴ 2013 DOD CMSD, p. 95. See also Ian M. Easton and L.C. Russell Hsiao, *The Chinese People's Liberation Army's Unmanned Aerial Vehicle Project: Organizational Capacities and Operational Capabilities*, Project 2049 Institute, March 11, 2013, 28 pp.; Bill Gertz, "Game of Drones," *Washington Free Beacon*, March 26, 2013.

¹⁰⁵ 2009 ONI Report, pp. 28-29. See also Eloise Lee and Robert Johnson, "The Chinese Navy Is Betting Big On Its New Submarine Hunting Drones," *Business Insider* (<http://articles.businessinsider.com>), April 12, 2012; Wendell Minnick, "China's Silver Hawk UAV Program Advances," *DefenseNews.com*, July 14, 2011; Kenji Minemura, "China Developing Unmanned Aircraft To Counter U.S. Forces," *Asahi Shimbun* (Japan), January 25, 2012.

¹⁰⁶ Bill Gertz, "Beijing Develops Pulse Weapons," *Washington Times*, July 22, 2011: 1. Except for "[July 21]," materials in brackets as in original.

Maritime Surveillance and Targeting Systems

China reportedly is developing and deploying maritime surveillance and targeting systems that can detect U.S. ships and submarines and provide targeting information for Chinese ASBMs and other Chinese military units. These systems reportedly include land-based over-the-horizon backscatter (OTH-B) radars, land-based over-the-horizon surface wave (OTH-SW) radars, electro-optical satellites, radar satellites, and seabed sonar networks.¹⁰⁷ DOD states that

The PLA Navy is also improving its over-the-horizon (OTH) targeting capability with sky wave and surface wave OTH radars, which can be used in conjunction with reconnaissance satellites to locate targets at great distances from China (thereby supporting long-range precision strikes, including employment of ASBMs).¹⁰⁸

Another observer states:

China's military modernization has given rise to an enormous Western literature dissecting its scope and progress. Despite this boom, many analysts have paid relatively little attention to recent advances in the People's Liberation Army's (PLA) command, control, communication, computer, intelligence, surveillance, and reconnaissance (C4ISR) capabilities.

The PLA's growing complement of manned and unmanned aircraft, reconnaissance satellites, and sophisticated ground-based infrastructure comprises the operational foundation of China's emerging network-centric military. It is also the means by which better-known systems, such as the DF-21D "carrier-killer" anti-ship ballistic missile or the J-20 stealth fighter, could actually fulfill their intended roles during a major regional contingency.

From recent developments in China's C4ISR infrastructure, it is clear that PLA is well on its way to becoming a sophisticated global military possessing many of the same C4ISR capabilities enjoyed by U.S. forces although it remains to be seen whether organizational barriers will short-circuit this trend....

Without breaking down the technological and organizational barriers between its constituent services, the PLA will not be able to implement the "system-of-systems" approach to anti-access operations and C4ISR that its leadership envisions. The PLA has taken some halting actions towards promoting joint operations and information sharing, such as the relatively decisive step of appointing Xu Qiliang, a PLAAF general, to command the deployed force during joint exercises in 2007. This was possibly the first time a PLAAF general was given such a high-profile command, although it hardly constitutes a breakthrough.

Assuming its Central Military Commission successfully limits the tendency of the ground forces to assert control over military doctrine and planning during the next ten to fifteen years, China's leadership will find that the PLA already possesses most if not all of the

¹⁰⁷ See 2011 DOD CMSD, pp. 3 and 38; Ben Blanchard, "China Ramps Up Military Use of Space With New Satellites – Report," *Reuters*, July 11, 2011; Andrew Erickson, "Satellites Support Growing PLA Maritime Monitoring and Targeting Capabilities," *China Brief*, February 10, 2011: 13-18; Torbjorg Hemmingsen, "Enter the Dragon: Inside China's New Model Navy," *Jane's Navy International*, May 2011: 14-16, 18, 20, 22, particularly the section on target tracking on pages 15-16; Simon Rabinovitch, "China's Satellites Cast Shadow Over US Pacific Operations," *Financial Times*, July 12, 2011; Andrew S. Erickson, "Eyes in the Sky," *U.S. Naval Institute Proceedings*, April 2010: 36-41.

¹⁰⁸ 2013 DOD CMSD, p. 42.

C4ISR systems and integrative technologies necessary to complete the PLA's transformation into a 21st century force.¹⁰⁹

Chinese Naval Operations Away from Home Waters

Chinese navy ships in recent years have begun to conduct operations away from China's home waters. Although many of these operations have been for making diplomatic port calls, some of them have been for other purposes, including in particular anti-piracy operations in waters off Somalia. DOD states that

China has become more involved in HA/DR [humanitarian assistance/disaster relief] operations in response to the [Chinese military's] "New Historic Missions." China's ANWEI-class military hospital ship (the *Peace Ark*) has deployed throughout East Asia and to the Caribbean.... China continues its Gulf of Aden counter-piracy deployment that began in December 2008. Outside of occasional goodwill cruises, this represents the PLA Navy's only series of operational deployments beyond the immediate western Pacific region.¹¹⁰

DOD also states that

The PLA Navy remains at the forefront of the military's efforts to extend its operational reach beyond East Asia and into what China calls the "far seas." Missions in these areas include protecting important sea lanes from terrorism, maritime piracy, and foreign interdiction; providing humanitarian assistance and disaster relief; conducting naval diplomacy and regional deterrence; and training to prevent a third party, such as the United States, from interfering with operations off China's coast in a Taiwan or South China Sea conflict. The PLA Navy's ability to perform these missions is modest but growing as it gains more experience operating in distant waters and acquires larger and more advanced platforms. The PLA Navy's goal over the coming decades is to become a stronger regional force that is able to project power across the globe for high-intensity operations over a period of several months, similar to the United Kingdom's deployment to the South Atlantic to retake the Falkland Islands in the early 1980s. However, logistics and intelligence support remain key obstacles, particularly in the Indian Ocean.

In the last several years, the PLA Navy's distant seas experience has primarily derived from its ongoing counter-piracy mission in the Gulf of Aden and long-distance task group deployments beyond the first island chain in the western Pacific. China continues to sustain a three-ship presence in the Gulf of Aden to protect Chinese merchant shipping from maritime piracy. This operation is China's first enduring naval operation beyond the Asia region....

The PLA Navy has made long-distance deployments a routine part of the annual training cycle. In 2012, it deployed task groups beyond the first island chain seven times with formations as large as seven ships. These deployments are designed to complete a number of training requirements, including long-distance navigation, C2, and multi-discipline warfare in deep sea environments beyond the range of land-based air defense.

¹⁰⁹ Shane Bilborough, "China's Emerging C4ISR Revolution," *The Diplomat* (<http://thediplomat.com>), August 13, 2013, accessed September 5, 2013, at <http://thediplomat.com/2013/08/13/chinas-emerging-c4isr-revolution/>.

¹¹⁰ 2013 DOD CMSD, p. 29.

The PLA Navy's force structure continues to evolve, incorporating more platforms with the versatility for both offshore and long-distance operations.¹¹¹

Some observers believe that China may want to eventually build a series of naval and other military bases in the Indian Ocean—a so-called “string of pearls”—so as to support Chinese naval operations along the sea line of communication linking China to Persian Gulf oil sources.¹¹² Other observers argue that although China has built or is building commercial port facilities in the Indian Ocean, China to date has not established any naval bases in the Indian Ocean and instead appears to be pursuing what U.S. officials refer to as a “places not bases” strategy (meaning a collection of places for Chinese navy ships to occasionally visit for purposes of refueling and restocking supplies, but not bases).¹¹³ DOD states that

Limited logistical support remains a key obstacle preventing the PLA Navy from operating more extensively beyond East Asia, particularly in the Indian Ocean. China desires to expand its access to logistics in the Indian Ocean and will likely establish several access points in this area in the next 10 years (potential sites include the Strait of Malacca, Lombok Strait, and Sunda Strait). These arrangements will likely take the form of agreements for refueling, replenishment, crew rest, and low-level maintenance. The services provided will likely fall short of U.S.-style agreements permitting the full spectrum of support from repair to re-armament.¹¹⁴

A May 14, 2013, press report states that

China's first aircraft carrier—the Liaoning—is expected to begin a long cruise this year and Indian Naval Intelligence says there are indications China is looking for bases to sustain a permanent naval presence in the Indian Ocean.

Gwadar base in Pakistan's Balochistan province recently had its depth dredged to 14 metres to allow aircraft carriers and submarines to dock and there is speculation that Sri Lanka may grant port facilities to Chinese ships at Hambantota port.

China is also known to be interested in establishing a naval presence in the Maldives and Chinese companies have won a contract to build the biggest port in Africa at Bagamoyo in north-east Tanzania.¹¹⁵

¹¹¹ 2013 DOD CMSD, pp. 38-39.

¹¹² Bill Gertz, “China Builds Up Strategic Sea Lanes,” *Washington Times*, January 18, 2005, p.1. See also Daniel J. Kostecka, “The Chinese Navy's Emerging Support Network in the Indian Ocean,” *China Brief*, July 22, 2010: 3-5; Edward Cody, “China Builds A Smaller, Stronger Military,” *Washington Post*, April 12, 2005, p. 1; Indrani Bagchi, “China Eyeing Base in Bay of Bengal?” *Times of India*, August 9, 2008, posted online at http://timesofindia.indiatimes.com/China_eyeing_base_in_Bay_of_Bengal/articleshow/3343799.cms; Eric Ellis, “Pearls for the Orient,” *Sydney Morning Herald*, July 9, 2010.

¹¹³ Daniel J. Kostecka, “A Bogus Asian Pearl,” *U.S. Naval Institute Proceedings*, April 2011: 48-52; Daniel J. Kostecka, “Places and Bases: The Chinese Navy's Emerging Support Network in the Indian Ocean,” *Naval War College Review*, Winter 2011: 59-78; Daniel J. Kostecka, “Hambantota, Chittagong, and the Maldives – Unlikely Pearls for the Chinese Navy,” *China Brief*, November 19, 2010: 8-11; Daniel J. Kostecka, “The Chinese Navy's Emerging Support Network in the Indian Ocean,” *China Brief*, July 22, 2010: 5.

¹¹⁴ 2013 DOD CMSD, p. 39.

¹¹⁵ “After Ladakh Incursions, China Flexes Its Muscles in Indian Ocean,” IBN Live, May 14, 2013, accessed May 17, 2013, at <http://ibnlive.in.com/news/after-ladakh-incursions-china-flexes-its-muscles-in-indian-ocean/391491-3.html>.

Numbers of Chinese Ships and Aircraft; Comparisons to U.S. Navy

Numbers Provided by ONI in 2013

Table 4 shows figures provided by ONI in 2013 on numbers of Chinese navy ships in 2000, 2005, and 2010, and projected figures for 2015 and 2020, along with the approximate percentage of ships within these figures considered by ONI to be of modern design.

Table 4. Numbers of PLA Navy Ships Provided by ONI in 2013

Ship type	2000	2005	2010	2015	2020
Numbers					
Diesel attack submarines (SSs)	60	51	54	57 to 62	59 to 64
Nuclear-powered attack submarines (SSNs)	5	6	6	6 to 8	6 to 9
Ballistic missile submarines	1	2	3	3 to 5	4 to 5
Aircraft carriers	0	0	0	1	1 to 2
Destroyers	21	21	25	28 to 32	30 to 34
Frigates	37	43	49	52 to 56	54 to 58
Corvettes	0	0	0	20 to 25	24 to 30
Amphibious ships	60	43	55	53 to 55	50 to 55
Missile-armed coastal patrol craft	100	51	85	85	85
Approximate percent of modern design					
Diesel attack submarines	7	40	50	70	75
Nuclear-powered attack submarines	0	33	33	70	100
Destroyers	20	40	50	70	85
Frigates	25	35	45	70	85

Source: Craig Murray, Andrew Berglund, and Kimberly Hsu, *China's Naval Modernization and Implications for the United States*, U.S.-China Economic and Security Review Commission (USCC), August 26, 2013, Figures 1 through 4 on pp. 6-7. The source notes to Figures 1 through 4 state that the numbers and percentages "were provided by the U.S. Office of Naval Intelligence. U.S. Office of Naval Intelligence, *PLA Navy Orders of Battle 2000-2020*, written response to request for information provided to the U.S.-China Economic and Security Review Commission, Suitland, MD, June 24, 2013." Citing this same ONI document, the USCC publication states in footnotes on pages 6 and 7 that "Modern submarines are those able to employ submarine-launched intercontinental ballistic missiles or antiship cruise missiles," and that "Modern surface ships are those able to conduct multiple missions or that have been extensively upgraded since 1992."

Numbers Provided by ONI in 2009

Table 5 shows figures provided by ONI in 2009 on numbers of Chinese navy ships and aircraft from 1990 to 2009, and projected figures for 2015 and 2020. *The figures in the table lump older and less capable ships together with newer and more capable ships discussed above.* The modern attack submarines, destroyers, and frigates shown in **Table 1**, **Table 2**, and **Table 3** for 2009 account for about half of the attack submarines, about half of the destroyers, and about 42% of the frigates shown in **Table 5** for 2009. The August 2009 ONI report states that "as newer and

more capable platforms replace aging platforms, the PLA(N)'s total order of battle may remain relatively steady, particularly in regard to the surface force."¹¹⁶

Table 5. Numbers of PLA Navy Ships and Aircraft Provided by ONI in 2009

(Figures include both older and less capable units and newer and more capable units)

	1990	1995	2000	2005	2009	Projection for 2015	Projection for 2020
Ships							
Ballistic missile submarines	1	1	1	2	3	4 or 5?	4 or 5?
Attack submarines (SSNs and SSs)	80	82	65	58	59	~70	~72
SSNs	5	5	5	6	6	n/a	n/a
SSs	75	77	60	52	53	n/a	n/a
Aircraft carriers	0	0	0	0	0	1?	2?
Destroyers	14	18	21	25	26	~26	~26
Frigates	35	35	37	42	48	~45	~42
Subtotal above ships	130	136	124	127	136	~146 or ~147?	~146 or ~147?
Missile-armed attack craft	200	165	100	75	80+	n/a	n/a
Amphibious ships	65	70	60	56	58	n/a	n/a
Large ships (LPDs/LHDs)	0	0	0	0	1	~6?	~6?
Smaller ships	65	70	60	56	57	n/a	n/a
Mine warfare ships	n/a	n/a	n/a	n/a	40	n/a	n/a
Major auxiliary ships	n/a	n/a	n/a	n/a	50	n/a	n/a
Minor auxiliary ships and support craft	n/a	n/a	n/a	n/a	250+	n/a	n/a
Aircraft							
Land-based maritime strike aircraft	n/a	n/a	n/a	n/a	~145	~255	~258
Carrier-based fighters	0	0	0	0	0	~60	~90
Helicopters	n/a	n/a	n/a	n/a	~34	~153	~157
Subtotal above aircraft	n/a	n/a	n/a	n/a	~179	~468	~505

Source: Prepared by CRS. Source for 2009, 2015, and 2020: *2009 ONI report*, page 18 (text and table), page 21 (text), and (for figures not available on pages 18 or 21), page 45 (CRS estimates based on visual inspection of ONI graph entitled "Estimated PLA[N] Force Levels"). Source for 1990, 1995, 2000, and 2005: Navy data provided to CRS by Navy Office of Legislative Affairs, July 9, 2010.

Notes: n/a is not available. The use of question marks for the projected figures for ballistic missile submarines, aircraft, carriers, and major amphibious ships (LPDs and LHDs) for 2015 and 2020 reflects the difficulty of resolving these numbers visually from the graph on page 45 of the ONI report. The graph shows more major amphibious ships than ballistic missile submarines, and more ballistic missile submarines than aircraft carriers. Figures in this table for aircraft carriers include the *Liaoning*. The ONI report states on page 19 that China "will likely have an operational, domestically produced carrier sometime after 2015." Such a ship, plus the *Liaoning*, would give China a force of 2 operational carriers sometime after 2015.

The graph on page 45 shows a combined total of amphibious ships and landing craft of about 244 in 2009, about 261 projected for 2015, and about 253 projected for 2015.

Since the graph on page 45 of the ONI report is entitled "Estimated PLA[N] Force Levels," aircraft numbers shown in the table presumably do not include Chinese air force (PLAAF) aircraft that may be capable of attacking ships or conducting other maritime operations.

¹¹⁶ *2009 ONI Report*, p. 46.

Numbers Presented in Annual DOD Reports to Congress

DOD states, “The PLA Navy has the largest force of major combatants, submarines, and amphibious warfare ships in Asia. China’s naval forces include some 79 principal surface combatants, more than 55 submarines, 55 medium and large amphibious ships, and roughly 85 missile-equipped small combatants.”¹¹⁷ **Table 6** shows numbers of Chinese navy ships as presented in annual DOD reports to Congress on military and security developments involving China (previously known as the annual report on China military power). *As with Table 5, the figures in Table 6 lump older and less capable ships together with newer and more capable ships discussed above.* The modern attack submarines, destroyers, and frigates shown in **Table 1**, **Table 2**, and **Table 3** for 2009 account for about half of the attack submarines, about half of the destroyers, and about 42% of the frigates shown in **Table 6** for 2009. DOD stated in 2011 that the percentage of modern units within China’s submarine force has increased from less than 10% in 2000 and 2004 to about 47% in 2008 and 50% in 2009, and that the percentage of modern units within China’s force of surface combatants has increased from less than 10% in 2000 and 2004 to about 25% in 2008 and 2009.¹¹⁸

Table 6. Numbers of PLA Navy Ships Presented in Annual DOD Reports to Congress

(Figures include both older and less capable units and newer and more capable units)

	2000	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Nuclear-powered attack submarines	5	5	~60	n/a	6	5	5	5	6	6	5	5	5
Diesel attack submarines	~60	~ 50		n/a	51	50	53	54	54	54	49	48	49
Destroyers	~20	~ 60	> 60	n/a	21	25	25	29	27	25	26	26	23
Frigates	~40			n/a	43	45	47	45	48	49	53	53	52
Missile-armed coastal patrol craft	n/a	~ 50	~ 50	n/a	51	45	41	45	70	85	86	86	85
Amphibious ships: LSTs and LPDs	almost 50	~ 40	> 40	n/a	20	25	25	26	27	27	27	28	29
Amphibious ships: LSMs				n/a	23	25	25	28	28	28	28	23	26

Source: Table prepared by CRS based on data in 2000-2013 editions of annual DOD report to Congress on military and security developments involving China (known for 2009 and prior editions as the report on China military power).

Notes: n/a means data not available in report. **LST** means tank landing ship; **LPD** means transport dock ship; **LSM** means medium landing ship.

Comparing U.S. and Chinese Naval Capabilities

U.S. and Chinese naval capabilities are sometimes compared by showing comparative numbers of U.S. and Chinese ships. Although numbers of ships (or aggregate fleet tonnages) can be relatively easy to compile from published reference sources, they are highly problematic as a means of assessing relative U.S. and Chinese naval capabilities, for the following reasons:

¹¹⁷ 2013 DOD CMSD, p. 6.

¹¹⁸ 2011 DOD CMSD, p. 43 (figure).

- **A fleet's total number of ships (or its aggregate tonnage) is only a partial metric of its capability.** In light of the many other significant contributors to naval capability,¹¹⁹ navies with similar numbers of ships or similar aggregate tonnages can have significantly different capabilities, and navy-to-navy comparisons of numbers of ships or aggregate tonnages can provide a highly inaccurate sense of their relative capabilities. In recent years, the warfighting capabilities of navies have derived increasingly from the sophistication of their internal electronics and software. This factor can vary greatly from one navy to the next, and often cannot be easily assessed by outside observation. As the importance of internal electronics and software has grown, the idea of comparing the warfighting capabilities of navies principally on the basis of easily observed factors such as ship numbers and tonnages has become increasingly less valid, and today is highly problematic.
- **Total numbers of ships of a given type (such as submarines, destroyers, or frigates) can obscure potentially significant differences in the capabilities of those ships, both between navies and within one country's navy.**¹²⁰ The potential for obscuring differences in the capabilities of ships of a given type is particularly significant in assessing relative U.S. and Chinese capabilities, in part because China's navy includes significant numbers of older, obsolescent ships. Figures on total numbers of Chinese submarines, destroyers, frigates, and coastal patrol craft lump older, obsolescent ships together with more modern and more capable designs.¹²¹ As mentioned earlier, DOD stated in 2011 that the percentage of modern units within China's submarine force has increased from less than 10% in 2000 and 2004 to 50% in 2008 and about 56% in 2010, and that the percentage of modern units within China's force of surface combatants has increased from less than 10% in 2000 and 2004 to about 25% in 2008 and 26% in 2010.¹²² This CRS report shows numbers of more modern and more capable submarines, destroyers, and frigates in **Table 1**, **Table 2**, and **Table 3**, respectively.
- **A focus on total ship numbers reinforces the notion that increases in total numbers necessarily translate into increases in aggregate capability, and that decreases in total numbers necessarily translate into decreases in aggregate capability.** For a Navy like China's, which is modernizing in some ship categories by replacing larger numbers of older, obsolescent ships with smaller numbers of more modern and more capable ships, this is not necessarily the case. As shown in **Table 5**, for example, China's submarine force today has fewer boats than it did in the 1990, but has greater aggregate capability than it did in 1990, because larger numbers of older, obsolescent boats have been replaced

¹¹⁹ These include types (as opposed to numbers or aggregate tonnage) of ships; types and numbers of aircraft; the sophistication of sensors, weapons, C4ISR systems, and networking capabilities; supporting maintenance and logistics capabilities; doctrine and tactics; the quality, education, and training of personnel; and the realism and complexity of exercises.

¹²⁰ Differences in capabilities of ships of a given type can arise from a number of other factors, including sensors, weapons, C4ISR systems, networking capabilities, stealth features, damage-control features, cruising range, maximum speed, and reliability and maintainability (which can affect the amount of time the ship is available for operation).

¹²¹ For an article discussing this issue, see Joseph Carrigan, "Aging Tigers, Mighty Dragons: China's bifurcated Surface Fleet," *China Brief*, September 24, 2010: 2-6.

¹²² 2011 DOD CMSD, p. 43 (figure).

by smaller numbers of more modern and more capable boats. A similar point might be made about China's force of missile-armed attack craft. DOD states that "Since the 1990s, the PLA Navy has rapidly transformed from a large fleet of low-capability, single-mission platforms, to a leaner force equipped with more modern, multi-mission platforms."¹²³ The August 2009 ONI report states that "even if [China's] naval force sizes remain steady or even decrease, overall naval capabilities can be expected to increase as forces gain multimission capabilities."¹²⁴ For assessing navies like China's, it can be more useful to track the growth in numbers of more modern and more capable units. This CRS report shows numbers of more modern and more capable submarines, destroyers, and frigates in **Table 1**, **Table 2**, and **Table 3**, respectively.

- **Comparisons of numbers of ships (or aggregate tonnages) do not take into account maritime-relevant military capabilities that countries might have outside their navies**, such as land-based anti-ship ballistic missiles (ASBMs), land-based anti-ship cruise missiles (ASCMs), and land-based air force aircraft armed with ASCMs or other weapons. Given the significant maritime-relevant non-navy forces present in both the U.S. and Chinese militaries, this is a particularly important consideration in comparing U.S. and Chinese military capabilities for influencing events in the Western Pacific. Although a U.S.-China incident at sea might involve only navy units on both sides, a broader U.S.-China military conflict would more likely be a force-on-force engagement involving multiple branches of each country's military.
- **The missions to be performed by one country's navy can differ greatly from the missions to be performed by another country's navy.** Consequently, navies are better measured against their respective missions than against one another. Although Navy A might have less capability than Navy B, Navy A might nevertheless be better able to perform Navy A's intended missions than Navy B is to perform Navy B's intended missions. This is another significant consideration in assessing U.S. and Chinese naval capabilities, because the missions of the two navies are quite different.

DOD Response to China Naval Modernization

Renewed DOD Emphasis on Asia-Pacific Region

Two DOD strategy and budget documents—one released on January 5, 2012, the other released on January 26, 2012—state that U.S. military strategy will place an increased emphasis on the Asia-Pacific region, and that as one result, there will be a renewed emphasis on air and naval forces in DOD plans. The release of these two documents followed statements by Administration officials beginning in the latter months of 2011 that identified the Asia-Pacific as a high-priority region for DOD in coming years. Administration officials have stated that notwithstanding reductions in planned levels of U.S. defense spending, the U.S. military presence in the Asia-Pacific region will be maintained and strengthened. Although Administration officials state that the renewed emphasis on the Asia-Pacific region is not directed at any single country, many

¹²³ 2011 DOD CMSD, p. 3.

¹²⁴ 2009 ONI Report, p. 46.

observers believe it is in no small part intended as a response to China's military modernization effort and its assertive behavior regarding its maritime territorial claims.

January 5, 2012, Strategic Guidance Document

On January 5, 2012, the Administration released a strategic guidance document that the Administration said would be used to guide decisions on the allocation of DOD resources in the FY2013 defense budget and future DOD budgets. In a cover letter to the document, President Obama stated that "as we end today's wars, we will focus on a broader range of challenges and opportunities, including the security and prosperity of the Asia Pacific." In another cover letter, Secretary of Defense Panetta stated that the U.S. military "will have global presence emphasizing the Asia-Pacific and the Middle East while still ensuring our ability to maintain our defense commitments to Europe, and strengthening alliances and partnerships across all regions." The document itself states in part:

U.S. economic and security interests are inextricably linked to developments in the arc extending from the Western Pacific and East Asia into the Indian Ocean region and South Asia, creating a mix of evolving challenges and opportunities. Accordingly, while the U.S. military will continue to contribute to security globally, *we will of necessity rebalance toward the Asia-Pacific region.* Our relationships with Asian allies and key partners are critical to the future stability and growth of the region. We will emphasize our existing alliances, which provide a vital foundation for Asia-Pacific security. We will also expand our networks of cooperation with emerging partners throughout the Asia-Pacific to ensure collective capability and capacity for securing common interests....

The maintenance of peace, stability, the free flow of commerce, and of U.S. influence in this dynamic region will depend in part on an underlying balance of military capability and presence. Over the long term, China's emergence as a regional power will have the potential to affect the U.S. economy and our security in a variety of ways. Our two countries have a strong stake in peace and stability in East Asia and an interest in building a cooperative bilateral relationship. However, the growth of China's military power must be accompanied by greater clarity of its strategic intentions in order to avoid causing friction in the region. The United States will continue to make the necessary investments to ensure that we maintain regional access and the ability to operate freely in keeping with our treaty obligations and with international law. Working closely with our network of allies and partners, we will continue to promote a rules-based international order that ensures underlying stability and encourages the peaceful rise of new powers, economic dynamism, and constructive defense cooperation....

In order to credibly deter potential adversaries and to prevent them from achieving their objectives, the United States must maintain its ability to project power in areas in which our access and freedom to operate are challenged. In these areas, sophisticated adversaries will use asymmetric capabilities, to include electronic and cyber warfare, ballistic and cruise missiles, advanced air defenses, mining, and other methods, to complicate our operational calculus. States such as China and Iran will continue to pursue asymmetric means to counter our power projection capabilities, while the proliferation of sophisticated weapons and technology will extend to non-state actors as well. *Accordingly, the U.S. military will invest as required to ensure its ability to operate effectively in anti-access and area denial (A2/AD) environments.* This will include implementing the Joint Operational Access Concept, sustaining our undersea capabilities, developing a new stealth bomber, improving missile

defenses, and continuing efforts to enhance the resiliency and effectiveness of critical space-based capabilities.¹²⁵

January 26, 2012, Document on Selected FY2013 Program Decisions

On January 26, 2012, DOD released a document outlining selected program decisions that will be included in DOD's proposed FY2013 budget. The January 26 document states that DOD's "leadership and subject matter experts assessed the potential strategic, military and programmatic risks associated with each budget decision in accordance with five major tenets within the President's strategic guidance [document of January 5, 2012]." The first of these five tenets, the document states, is: "Rebalance force structure and investments toward the Asia-Pacific and Middle East regions while sustaining key alliances and partnerships in other regions." The document states that

The focus on the Asia-Pacific region places a renewed emphasis on air and naval forces while sustaining ground force presence. The Middle East has been dominated by ground force operations over the last decade; however, as we gradually transition security in Afghanistan and reestablish peacetime ground force presence, this region will also become increasingly maritime. Therefore we: ...

- Maintained the aircraft carrier fleet at 11 ships and 10 [carrier] air wings
- Maintained the big-deck amphibious fleet ...¹²⁶
- Budgeted to forward station Littoral Combat Ships in Singapore and patrol craft in Bahrain
- Funded development of a new afloat forward staging base that can be dedicated to support missions in areas where ground-based access is not available, such as counter-mine operations

For these forces to remain capable, we had to invest in capabilities required to maintain our military's continued freedom of action in the face of new technologies designed to frustrate access advantages. Consequently, we increased or protected investment in capabilities that preserve the U.S. military's ability to project power in contested areas and strike quickly from over the horizon, including:...

- Design changes to increase cruise missile capacity of future Virginia-class submarines¹²⁷
- Design of a conventional prompt strike option from submarines¹²⁸

¹²⁵ Department of Defense, *Sustaining U.S. Global Leadership: Priorities for 21st Century Defense*, January 2012, cover letters and pp. 2, 4-5. Italics as in original. For further discussion of this document, see CRS Report R42146, *In Brief: Assessing the January 2012 Defense Strategic Guidance (DSG)*, by Catherine Dale and Pat Towell.

¹²⁶ This is a reference to the Navy's inventory of LHA- and LHD-type amphibious assault ships. These ships, which resemble medium-sized aircraft carriers, are often referred to as big-deck or large-deck amphibious ships because their flight decks are much larger than those of the Navy's smaller (i.e., LPD- and LSD-type) amphibious ships.

¹²⁷ This appears to be a reference to a plan to build future Virginia (SSN-774) class attack submarines to a lengthened design that includes an additional mid-body section, called the Virginia Payload Module (VPM) containing four large-diameter vertical launch tubes for firing cruise missiles and other payloads. For more on the VPM, see CRS Report RL32418, *Navy Virginia (SSN-774) Class Attack Submarine Procurement: Background and Issues for Congress*, by Ronald O'Rourke.

- Upgraded radars for tactical aircraft and ships

To ensure sufficient resources to protect these strategic priorities, we will reduce the number of ships by slowing the pace of building new ships and by accelerating the retirement of some existing ships. These include:

- Retiring 7 cruisers early – 6 did not have ballistic missile defense (BMD) capability, and the seventh with BMD capability is in need of costly hull repairs¹²⁹
- Slipping a large deck amphibious ship (LHA) by 1 year¹³⁰
- Slipping 1 new Virginia class submarine outside the FYDP [Five Year Defense Plan]
- Reducing Littoral Combat Ships by 2 ships in the FYDP¹³¹
- Reducing Joint High Speed Vessels by 8 in the FYDP¹³²
- Retiring 2 smaller amphibious ships (LSD) early and moving their replacement outside the FYDP ...¹³³

This strategic precept puts a premium on self- and rapidly-deployable forces that can project power and perform multiple mission types. This reinforces the need to maintain existing numbers of aircraft carriers, large-deck amphibious ships, and bombers. Furthermore, as the Marine Corps withdraws from the ground in Afghanistan, it will return to afloat posture, with the capability to rapidly respond to crises as they emerge. These choices are consistent with our strategic emphasis on the Asia-Pacific region and the Middle East, but are applicable anywhere on the globe where U.S. national security or vital interests are threatened...

Our ability to project power is a key component of our strategic guidance. We protected... aircraft carriers, surface combatant modernization.... We also protected capabilities that allow us to project power in denied environments. In addition to those discussed earlier, such as... increasing the cruise missile capacity of future submarines, we protected anti-submarine warfare and counter-mine capabilities....¹³⁴

(...continued)

¹²⁸ This appears to refer to a new, fast-flying weapon that would be launched from submarines.

¹²⁹ The Navy currently has 22 Ticonderoga (CG-47) class Aegis cruisers; retiring seven early would reduce the inventory of these ships to 15.

¹³⁰ Under the FY2012 budget submission, the next LHA-type ship was to be procured in FY2016; the deferral would thus appear to be FY2017.

¹³¹ This may be a deferral of the procurement of two LCSs, but not a reduction in the planned total LCS procurement of 55 ships.

¹³² This may reflect a reduction in the JHSV force-level goal from 21 ships to 10.

¹³³ The Navy currently operates 12 LSD-type amphibious ships; retiring two early would reduce the inventory to 10. The planned replacement for these LSDs is a new ship class called the LSD(X). The Navy had previously announced that the first LSD(X) was to be procured in FY2017; the new announcement here suggests that the procurement date for this ship has been deferred to a later year.

¹³⁴ Department of Defense, *Defense Budget: Priorities and Choices*, January 2012, pp. 4, 5, 6, 7, 9.

September 2011 Press Report About New Defense Planning Guidance

A September 29, 2011, press report stated that a new DOD Defense Planning Guidance (DPG) document¹³⁵ dated August 29, 2011, “advocat[es] increased investment in military capabilities designed for high-end war among major powers, according to sources familiar with the document.” The report stated that the new DPG “signals a ‘new seriousness [in DOD planning] about major-power war,’ which could trigger a ‘flowering of air and naval power,’ said a former service official familiar with the guidance.” The report stated that DOD “is planning to reduce capability for conventional military operations and counterinsurgency, shrink the size of the military, maintain counterterrorism capability and invest more in countering high-end threats like long-range weapons being developed by China that could challenge U.S. power projection capabilities in the Western Pacific, said a military official familiar with Panetta’s guidance.” The report stated that “if the [DOD] budget [for FY2013 and beyond] comes out with the ‘one-third, one-third, one-third’ ratio intact, the comprehensive review ‘should be judged a complete failure,’ an administration official said. The Army’s [budget] topline will likely be cut harder than other services, the official said.”¹³⁶

October 3, 2012, Remarks by Deputy Secretary of Defense Carter

In an October 3, 2012, address on the U.S. strategic rebalancing to the Asia-Pacific, Deputy Secretary of Defense Ashton Carter stated in part:

[Observers] ask whether the United States has the ability to meet the objectives we’ve set for ourselves in the rebalance. It is fair question, given our fiscal realities. And today I want to tell you how it is that we do have the capacity to resource the rebalance and meet our commitments.

With our allies and partners, I think you’ll see, we are, in fact, across the Asia-Pacific region able to invest to sustain peace and prosperity. In other words, we are not just talking the talk, we are walking the walk. And I’d ask if you don’t believe us, to just watch our steps over coming months and years, and you’ll see us implement the rebalance.

And today I want to tell you a bit about those steps, at least the steps we in the Pentagon are taking as part of what is a broader government-wide rebalancing....

To those who ask whether we will be able to deliver on our security commitments under our rebalance, I am gonna give you five reasons why we will be able to do so.

The first is due to increased military capacity. With the war in Iraq now over, and as we transition security responsibilities to the government of Afghanistan, we will release much of our military capacity that has been tied up there for other missions, like fostering peace and strengthening partnerships in the Asia-Pacific. Naval assets that will be released from

¹³⁵ The DPG is an internal DOD document that guides DOD’s preparation of its proposed budget.

¹³⁶ Christopher J. Castelli, “DOD Aims To Boost Investment In Capabilities For Major-Power War,” *Inside the Pentagon*, September 29, 2011. The phrase “one-third, one-third, one-third ratio” is a reference to the division of the DOD “base” budget (i.e., the DOD budget other than the part that funds operations in Afghanistan and Iraq) between the Army, the Navy and Marine Corps, and the Air Force. The current division of the DOD base budget not an exact one-third, one-third, one-third division, but the phrase has come into use as a shorthand way of referring to the current budget division, which has remained relatively unchanged in recent years.

Afghanistan and the Middle East include surface combatants, amphibious ships, and, eventually, aircraft carriers.

From the Air Force, unmanned systems and intelligence, surveillance and reconnaissance assets, as well as bomber, cyber, and space forces, can all be redeployed and refocused on the Asia-Pacific region. In the Army and the Marine Corps, equipment and personnel previously committed to Iraq and Afghanistan are available for new missions in other regions.

Second, we are investing in new capabilities that will be especially relevant to the Asia-Pacific region. And we have carefully protected these capabilities, even in the face of the Budget Control Act. In the Navy, we are investing in the Virginia-class submarine and the Virginia payload module, which will allow our attack submarines to carry torpedo-sized weapons and over 60 cruise missiles.

We are investing in anti-submarine warfare capabilities to maintain our enormous undersea advantage, including P-8A maritime patrol aircraft, the M-60 helicopter, as well as ISR assets, like the Broad Area Maritime Sensor, BAMS, which is essentially a marinized version of the Global Hawk. And the Air Force is investing in the KC-46 refueling tanker, a new very stealthy bomber, and a host of ISR investments that will be relevant to the region.

One of the key tenets of our defense strategy is to protect our future-focused investments—the “seed corn” of the future force. President Obama was crystal clear—very insistent—about this himself during our strategy and budget deliberations last winter. And that’s what we’re doing as we budget. Our newest investments of course have the shallowest roots, so it’s easy to tear them away when budget cuts are made, but we can’t afford to do that, we can’t afford to lose our future technological edge, particularly as we look to the Asia-Pacific region. And so we’re protecting those investments.

We are investing in things like cyber, space, and electronic warfare; Unmanned Aerial Vehicles; the Long Range Strike family of systems, all of which are so important to the Asia-Pacific region. And we will continue our science and technology investments across the board.

The third reason why we can carry out the rebalance is that we are shifting our posture forward and into the Asia-Pacific region. That it, not what we have, but where we put it is also changing. By 2020, we will have shifted 60 percent of our naval assets to the Pacific.

That’s an historic change for the United States Navy. The Marine Corps will have up to 2,500 Marines on rotation in Australia, we will have four Littoral Combat Ships stationed forward in Singapore—new Littoral Combat Ships, I was just aboard both of the variants in San Diego last week—and will proceed fully to build-out our military presence on Guam and surrounding areas, which is an important strategic hub for the Western Pacific.

We will begin to rotate B-1 bombers into the region, augmenting the B-52 bombers already on continuous rotation. We have already deployed F-22s to Kadena Air Force Base in Japan, and we will deploy the F-35 Joint Strike Fighter to the region. Said differently, we are sending our newest assets to the Asia-Pacific region first.

Fourth, we are working closely with our allies and partners to build a peaceful Asia-Pacific where every state in the region may prosper, and we do that project together. The State Department of course leads our diplomatic engagement in the region, but our defense relationships play a big part as well....

Fifth, and last, the Defense Department is turning its formidable innovative power to the Asia-Pacific region. We are by no means abandoning counterinsurgency—that’s a core skill-set we’ve gotten very good at doing, and which we’re gonna keep. But as we come out of Iraq and Afghanistan, defense planners, analysts, scientists, and institutions across the country are devoting more and more of their time to thinking about the Asia-Pacific region.

We are developing new operational concepts for our forces. We are integrating operations and aligning the Air Force and Navy to maintain access in contested regions. We are reviewing our contingency plans to ensure we are prepared for any opportunity or challenge that may arise.

So the Pentagon leadership is focused intently on executing the rebalance....

So, in conclusion, we are not just talking the talk of rebalance—we are walking the walk. Even in a period of fiscal austerity, we can and will invest in a continued military presence and engagement for the Asia-Pacific region¹³⁷

Air-Sea Battle (ASB) Concept

DOD has been developing a new Air-Sea Battle (ASB) concept that is intended to increase the joint operating effectiveness U.S. naval and Air Force units, particularly in operations for countering anti-access forces. The ASB development effort was announced in the 2010 Quadrennial Defense Review. DOD has established an Air-Sea Battle Office to guide the implementation of the concept.¹³⁸ Although DOD officials state that the ASB concept is not directed at any particular adversary, many observers believe it is focused to a large degree, if not principally, on countering Chinese and Iranian anti-access forces.

For more on the ASB concept, see **Appendix A**.

August 2013 Press Report on Revisions to War Plans

An August 2, 2013, press report stated that

The U.S. military is conducting a sweeping overhaul of its war plans for potential conflicts from the Middle East to the Pacific, as commanders adapt to a future of dwindling numbers of ground troops.

Plans that had presumed the availability of large U.S. forces for invasions and occupations are being redrafted to incorporate strategies such as quick-reaction ground units, air power and Navy ships, according to officials. A big part of the new plans will be options for the use of cyberweapons, which can disable enemies’ offensive and defensive capabilities....

¹³⁷ Remarks by Deputy Secretary of Defense [Ashton] Carter at the Woodrow Wilson Center, October 3, 2012, accessed online October 17, 2012, at <http://www.defense.gov/transcripts/transcript.aspx?transcriptid=5130>.

¹³⁸ Christopher P. Cavas, “Air-Sea Battle Office Targets DoD Blind Spots,” *NavyTimes.com*, November 10, 2011; Gabe Starosta, “Pentagon Stands Up new AirSea Battle Office,” *Inside the Navy*, November 14, 2011; Ann Roosevelt, “DoD Office Created To Implement Air-Sea Battle Concept,” *Defense Daily*, November 14, 2011: 6; Michael Fabey, “Pentagon Acknowledges New Air-Sea Battle Office,” *Aerospace Daily & Defense Report*, November 14, 2011: 3.

... officials said the military had looked at existing plans for conflicts in the Middle East involving Iran, as well as conflicts in Asia, particularly in the South China Sea and East China Sea, where U.S. allies and partners have conflicting territorial claims with China....

A defense official said that with the war in Afghanistan coming to an end, the U.S. is at “a strategic inflection point.” War plans hadn't been updated to conform with revisions to military strategy outlined by President Barack Obama in 2012.

Defense officials said Defense Secretary Chuck Hagel has received regular updates on the work, and has reviewed the revised plans for Asia.¹³⁹

Navy Response to China Naval Modernization

The U.S. Navy has taken a number of steps in recent years that appear intended, at least in part, at improving the U.S. Navy's ability to counter Chinese maritime anti-access capabilities, including but not limited to those discussed below. A November 14, 2012, article by Admiral Jonathan Greenert, the Chief of Naval Operations, provides an overview of Navy activities associated with the U.S. strategic rebalancing toward the Asia-Pacific (which Administration officials state is not directed at any one state in particular); the text of the article is presented in **Appendix B**.

Force Posture and Basing Actions

The final report on the 2006 QDR directed the Navy “to adjust its force posture and basing to provide at least six operationally available and sustainable carriers and 60% of its submarines in the Pacific to support engagement, presence and deterrence.”¹⁴⁰ Additional force posture actions that appear intended, at least in part, at improving the U.S. Navy's ability to counter Chinese maritime anti-access capabilities, include the following:

- earlier actions (i.e., actions implemented over the past several years):
 - shifting three Pacific Fleet Los Angeles (SSN-688) class SSNs to Guam (the Navy announced in April 2013 that a fourth will be moved to Guam);
 - basing all three Seawolf (SSN-21) class submarines—the Navy's largest and most heavily armed SSNs—in the Pacific Fleet (at Kitsap-Bremerton, WA);
 - basing two of the Navy's four converted Trident cruise missile/special operations forces submarines (SSGNs) in the Pacific (at Bangor, WA);¹⁴¹
 - assigning most of the Navy's ballistic missile defense (BMD)-capable Aegis cruisers and destroyers to the Pacific—and homeporting some of those ships at Yokosuka, Japan, and Pearl Harbor, HI;
- more recent actions:
 - announcing an intention to increase the share of the Navy's ships that are homeported in the Pacific from the current figure of 55% to 60% by 2020;¹⁴²

¹³⁹ Julian E. Barnes, “Pentagon Conducts Overhaul Of War Plans,” *Wall Street Journal*, August 2, 2013: 5.

¹⁴⁰ U.S. Department of Defense, *Quadrennial Defense Review Report*. Washington, 2006. (February 6, 2006) p. 47.

¹⁴¹ For more on the SSGNs, see CRS Report RS21007, *Navy Trident Submarine Conversion (SSGN) Program: Background and Issues for Congress*, by Ronald O'Rourke.

and to increase by about 20% (from about 50 ships to about 60 ships) the number of Navy ships that will be stationed in or forward-deployed to the Pacific;

- announcing an intention to station up to four Littoral Combat Ships (LCSs) at Singapore by 2017 (with the first sent there in March 2013 for an 8- to 10-month deployment),¹⁴³ and an additional seven LCSs in Japan by 2022;¹⁴⁴
- announcing a plan to rotate Marines on six-month training deployments through Darwin, Australia, with the number Marines in each deployment increasing from an initial figure of 200 to 250 to 1,150 in 2014 and 2,500 in 2016;¹⁴⁵ and
- conducting talks with the Philippines about the possibility of rotating surveillance aircraft or perhaps Navy ships through Philippine bases.¹⁴⁶

Acquisition Programs

As mentioned earlier (see “Limitations and Weaknesses” in “Background”), China’s navy exhibits limitations or weaknesses in several areas, including antisubmarine warfare (ASW) and mine countermeasures (MCM). Countering China’s naval modernization might thus involve, among other things, actions to exploit such limitations and weaknesses, such as developing and procuring Virginia (SSN-774) class attack submarines, torpedoes, unmanned underwater vehicles (UUVs), and mines.

Many of the Navy’s programs for acquiring highly capable ships, aircraft, and weapon systems can be viewed as intended, at least in part, at improving the U.S. Navy’s ability to counter Chinese maritime anti-access capabilities. Examples of highly capable ships now being acquired include Ford (CVN-78) class aircraft carriers,¹⁴⁷ Virginia (SSN-774) class attack submarines,¹⁴⁸ and Arleigh Burke (DDG-51) class Aegis destroyers, including the new Flight III version of the DDG-51, which is to be equipped with a new radar for improved air and missile defense

(...continued)

¹⁴² See, for example, Mike McCarthy, “New Ships Will Account For Asia-Pacific Buildup, SECNAV Says,” *Defense Daily*, March 9, 2012: 4-6; Bill Bartel, “Changes Are Coming To Hampton Roads, Navy Says,” *Norfolk Virginian-Pilot*, March 6, 2012; U.S. Navy, *CNO’s Position Report: 2012*, undated but released by the Navy in October 2012, p. 2; Jonathan Greenert, “Sea Change, The Navy Pivots to Asia,” *Foreign Policy* (www.foreignpolicy.com), November 14, 2012.

¹⁴³ Jim Wolf, “U.S. Plans 10-Month Warship Deployment To Singapore,” *Reuters.com*, May 10, 2012; Jonathan Greenert, “Sea Change, The Navy Pivots to Asia,” *Foreign Policy* (www.foreignpolicy.com), November 14, 2012.

¹⁴⁴ Zachary Keck, “U.S. Chief of Naval Operations: 11 Littoral Combat Ships to Asia by 2012,” *The Diplomat* (<http://thediplomat.com>), May 17, 2013.

¹⁴⁵ Seth Robson, “US Increasing Number of Marines On Rotation To Australia,” *Stars and Stripes* (*Stripes.com*), June 15, 2013.

¹⁴⁶ See, for example, Manuel Mogato, “Philippines Study U.S. Offer to Deploy Spy Planes,” *Reuters.com*, January 27, 2012.

¹⁴⁷ For more on the CVN-78 program, see CRS Report RS20643, *Navy Ford (CVN-78) Class Aircraft Carrier Program: Background and Issues for Congress*, by Ronald O’Rourke.

¹⁴⁸ For more on the Virginia-class program, see CRS Report RL32418, *Navy Virginia (SSN-774) Class Attack Submarine Procurement: Background and Issues for Congress*, by Ronald O’Rourke.

operations.¹⁴⁹ The procurement rate of Virginia-class submarines was increased to two per year in FY2011, and the Navy wants to start procuring the Flight III version of the DDG-51 in FY2016.

Examples of highly capable aircraft now being acquired by the Navy include F-35C carrier-based Joint Strike Fighters (JSFs),¹⁵⁰ F/A-18E/F Super Hornet strike fighters and EA-18G Growler electronic attack aircraft,¹⁵¹ E-2D Hawkeye early warning and command and control aircraft, the P-8A Multi-mission Maritime Aircraft (MMA), the Navy carrier-based Unmanned Combat Air System (N-UCAS program) demonstrator program, and the follow-on Unmanned Carrier Launched Airborne Surveillance and Strike (UCLASS) system.¹⁵² Some analysts, such as those at the Center for Strategic and Budgetary Assessments (CSBA), an independent defense study group, have emphasized the need for the Navy to develop and acquire a long-range unmanned aircraft such as UCLASS for use on Navy aircraft carriers. A September 29, 2011, press report on a new DOD Defense Planning Guidance (DPG) document stated:

“The Navy and Air Force are positioned to do well [in forthcoming DOD budgets]—but I imagine business as usual for them won’t be an option either,” [an administration official] said, noting unmanned aircraft will need to be a prominent feature for both. The Navy needs to “get serious” about unmanned combat air vehicles “if they want to keep carriers relevant” and the Air Force “needs to rethink whether the [service’s planned new] long-range bomber will be manned,” the official said.¹⁵³

The Navy is also developing a number of new sensor and weapon technologies that might be of value in countering Chinese maritime anti-access capabilities, such as an electromagnetic rail gun (EMRG) whose potential missions include air and missile defense, and high-power free electron lasers (FELs) and solid state lasers (SSLs), whose potential missions also include air and missile defense.¹⁵⁴ A “CNO’s position report” document issued by the Navy in October 2012 stated that the Navy in 2012 “methodically continued investment in the capabilities needed to complete ‘kill chains’ of sensors, shooters and weapons that enable our forces to project power and assure access, particularly in the Asia-Pacific and Middle East.”¹⁵⁵

An October 10, 2011, press report states that Admiral Jonathan Greenert, the Chief of Naval Operations (CNO), in a memorandum dated September 23, 2011, “has launched a new review to identify warfighting investments that could counter Chinese military methods for disrupting key battlefield information systems.” According to the report, the memorandum “requests options for warfighting in ‘the complex electromagnetic environment’ and for countering ‘anti-access/area-

¹⁴⁹ For more on the DDG-51 program, including the planned Flight III version, see CRS Report RL32109, *Navy DDG-51 and DDG-1000 Destroyer Programs: Background and Issues for Congress*, by Ronald O'Rourke.

¹⁵⁰ For more on the F-35 program, see CRS Report RL30563, *F-35 Joint Strike Fighter (JSF) Program*, by Jeremiah Gertler.

¹⁵¹ For more on the F/A-18E/F and EA-18G programs, see CRS Report RL30624, *Navy F/A-18E/F and EA-18G Aircraft Program*, by Jeremiah Gertler.

¹⁵² The Navy is currently developing a stealthy, long-range, unmanned combat air system (UCAS) for use in the Navy's carrier air wings. The demonstration program for the system is called UCAS-D. The subsequent production version of the aircraft is called N-UCAS, with the N standing for Navy.

¹⁵³ Christopher J. Castelli, “DOD Aims To Boost Investment In Capabilities For Major-Power War,” *Inside the Pentagon*, September 29, 2011.

¹⁵⁴ For more on the Navy's laser-development efforts, see CRS Report R41526, *Navy Shipboard Lasers for Surface, Air, and Missile Defense: Background and Issues for Congress*, by Ronald O'Rourke.

¹⁵⁵ U.S. Navy, *CNO's Position Report: 2012*, p. 2.

denial' threats—terms closely associated with China's military." The report quotes the memorandum as stating that "Today's weapons rely on EM [electromagnetic] sensors, EM communications and EM seekers to complete their 'kill chains,' while defenders are increasingly turning to EM methods for protection," and that "some kill chains never leave the EM environment at all, damaging an adversary's military capability by affecting control systems alone—no bomb or missile required." The report states that the memorandum "directs the group to 'generate innovative concepts for [the] Navy to employ the EM environment as a primary line of operation in a 2025-2030 warfighting campaign.'"¹⁵⁶

In a December 2011 journal article, Greenert stated that

regional powers in 2025 could use ballistic and cruise missiles, submarines, and guided rockets and artillery to prevent military forces or legitimate users from entering an area ("anti-access," or A2) or operating effectively within an area ("area-denial," or AD). Those capabilities can be characterized as defensive, reducing opposition to them, and they can be deployed from the country's mainland territory, making attacks against them highly escalatory. Their intended purpose, however, is clear—intimidation of neighboring countries, including U.S. allies and partners. Aggressors can threaten to hold key maritime crossroads at risk, render territorial claims moot, and assert that intervention by the United States or others in these disputes can be delayed or prevented. The stated or unstated implication is that their neighbors should capitulate to the aggressor's demands.

To help defend our allies and protect our interests, U.S. forces in 2025 will need to be able to operate and project power despite adversary A2/AD capabilities. Over the next decade naval and air forces will implement the new AirSea Battle Concept and put in place the tactics, procedures, and systems of this innovative approach to the A2/AD challenge....

Over the next decade, maintaining the Navy's war-fighting edge and addressing fiscal constraints will require significant changes in how we develop the force. We will need to shift from a focus on platforms to instead focus on what the platform carries. We have experience in this model. Aircraft carriers, amphibious ships and the littoral combat ships are inherently reconfigurable, with sensor and weapon systems that can evolve over time for the expected mission. As we apply that same modular approach to each of our capabilities, the weapons, sensors, unmanned systems, and electronic-warfare systems that a platform deploys will increasingly become more important than the platform itself.

That paradigm shift will be prompted by three main factors. First, the large number, range of frequencies, and growing sophistication of sensors will increase the risk to ships and aircraft—even "stealthy" ones—when operating close to an adversary's territory. Continuing to pursue ever-smaller signatures for manned platforms, however, will soon become unaffordable. Second, the unpredictable and rapid improvement of adversary A2/AD capabilities will require faster evolution of our own systems to maintain an advantage or asymmetrically gain the upper hand. This speed of evolution is more affordable and technically possible in weapons, sensors, and unmanned systems than in manned platforms.

The third factor favoring a focus on payloads is the changing nature of war. Precision-guided munitions have reduced the number and size of weapons needed to achieve the same effect. At the same time, concerns for collateral damage have significantly lowered the number of

¹⁵⁶ Christopher J. Castelli, "Memo: Navy Seeks To Counter China's Battle-Disruption Capabilities," *Inside the Navy*, October 10, 2011.

targets that can be safely attacked in a given engagement. The net effect is fewer weapons are needed in today's conflicts.

Together, those trends make guided, precision stand-off weapons such as Tomahawk land-attack missiles, joint air-surface stand-off missiles, and their successors more viable and cost-effective alternatives to increasingly stealthy aircraft that close the target and drop bombs or shoot direct-attack missiles. To take full advantage of the paradigm shift from platform to payload, the Fleet of 2025 will incorporate faster, longer-range, and more sophisticated weapons from ships, aircraft, and submarines. In turn, today's platforms will evolve to be more capable of carrying a larger range of weapons and other payloads.

Those other payloads will include a growing number of unmanned systems. Budget limitations over the next 10 to 15 years may constrain the number of ships and aircraft the Navy can buy....

The future Fleet will deploy a larger and improved force of rotary wing unmanned aerial vehicles (UAVs) including today's Fire Scout and soon, the armed Fire-X. Those vehicles were invaluable in recent operations in Libya and in counterterrorism operations around the Central Command area of responsibility. Deploying from the deck of a littoral combat ship, a detachment of Fire Scouts can provide continuous surveillance more than 100 miles away. Those systems will expand the reach of the ship's sensors with optical and infrared capabilities, as well as support special operations forces in the littorals. Even more significant, the Fleet of 2025 will include UAVs deploying from aircraft carrier decks. What started a decade ago as the unmanned combat air system will be operating by 2025 as an integral element of some carrier air wings, providing surveillance and some strike capability at vastly increased ranges compared with today's strike fighters. Once that aircraft is fielded, it will likely take on additional missions such as logistics, electronic warfare, or tanking.

Submarines will deploy and operate in conjunction with a family of unmanned vehicles and sensors by 2025 to sustain the undersea dominance that is a clear U.S. asymmetric advantage. Large-displacement unmanned underwater vehicles (UUVs) will deploy from ships, shore, or Virginia-class submarine payload tubes to conduct surveillance missions. With their range and endurance, large UUVs could travel deep into an adversary's A2/AD envelope to deploy strike missiles, electronic warfare decoys, or mines. Smaller UUVs will be used by submarines to extend the reach of their organic sensors, and will operate in conjunction with unattended sensors that can be deployed from surface combatants, submarines, and P-8A patrol aircraft. The resulting undersea network will create a more complete and persistent "common operational picture" of the underwater environment when and where we need it. This will be essential to finding and engaging adversary submarines, potentially the most dangerous A2/AD capability.

The undersea picture is extremely important in terms of countering enemy mining. The most basic of A2/AD weapons, mines can render an area of ocean unusable for commercial shipping for weeks or months while we laboriously locate and neutralize them. Even the threat of mines is enough to severely restrict ship movements, significantly affecting trade and global economic stability if it happens in key choke points such as the Malacca or Hormuz straits. The mine countermeasure capabilities we are developing for littoral combat ships and MH-60 aircraft rely heavily on unmanned sensors to rapidly build the underwater picture, and unmanned neutralization systems to disable mines. By 2025 those systems will be fully fielded, and their portable nature could allow them to be another swappable payload on a range of combatants....

Electronic warfare (EW) and cyber operations are increasingly essential to defeating the sensors and command and control (C2) that underpin an opponent's A2/AD capabilities. If the adversary is blinded or unable to communicate, he cannot aim long-range ballistic and

cruise missiles or cue submarines and aircraft. Today, Navy forces focus on deconflicting operations in the electromagnetic spectrum or cyber domains. By 2025, the Fleet will fully operationalize those domains, more seamlessly managing sensors, attacks, defense, and communications, and treating EW and cyber environments as “maneuver spaces” on par with surface, undersea, or air.

For example, an electronic jammer or decoy can defeat individual enemy radar, and thus an enemy C2 system using the radar’s data. A cyber operation might be able to achieve a similar effect, allowing U.S. forces to avoid detection. This is akin to using smoke and “rubber-duck” decoys in World War II to obscure and confuse the operational picture for Japanese forces, allowing U.S. ships to maneuver to an advantageous position. The future Fleet will employ EW and cyber with that same sense of operational integration.¹⁵⁷

An August 20, 2012, press report stated that the Air-Sea Battle concept prompted Navy officials to make significant shifts in the service’s FY2014-FY2018 budget plan, including new investments in ASW, electronic attack and electronic warfare, cyber warfare, the F-35 Joint Strike Fighter (JSF), the P-8A maritime patrol aircraft, and the Broad Area Maritime Surveillance (BAMS) UAV (a maritime version of the Global Hawk UAV). The report quoted Chief of Naval Operations Jonathan Greenert as saying that the total value of the budget shifts was certainly in the hundreds of millions of dollars, and perhaps in the “low billions” of dollars.¹⁵⁸

A July 13, 2013, blog post states that

a new and dangerous mystery weapon has America’s admirals scared.

That’s according to a recent approval for up to \$65 million over three years from the Naval Research Laboratory to defense contractor ITT Exelis. The funds, according to a Navy document, are for a suite of 24 electronic warfare systems to be mounted on U.S. warships sailing near Chinese waters.

The reason? It’s “necessary to thwart an immediate threat for naval fleet operations,” the Navy stated. The sailing branch wants the new defenses in place by March 2014.

The urgent notice, first spotted by Military & Aerospace Electronics, is an unusually stark warning for the planet’s mightiest fleet. Navy officials told the magazine the undisclosed danger is a “newly discovered threat,” which caused U.S. Pacific Fleet commander Adm. Cecil Haney to fast-track the project.

The Navy isn’t saying what the threat is, which country developed it or when it was discovered by the Americans. Requests to the Navy for comment were not returned.

But it’s possible to make informed guesses. As the trade magazine notes, “shipboard electronic warfare systems typically are designed to detect and jam enemy radar threats—particularly the electronics in *radar-guided anti-ship missiles*.” (Our emphasis.)

¹⁵⁷ Jonathan Greenert, “Navy, 2025: Forward Warfighters,” *U.S. Naval Institute Proceedings*, December 2011: 20. Greenert’s statement about stationing several LCSs at Singapore followed statements by other Administration officials dating back to June 2011 about operating a small number of LCSs out of Singapore. See, for example, Wong Maye-E (Associated Press), “Gates Pledges Wider U.S. Military Presence in Asia,” *USA Today*, June 4, 2011; and Dan de Luce (Agence France-Presse), “Gates: New Weapons For ‘Robust’ U.S. Role in Asia,” *DefenseNews.com*, June 3, 2011.

¹⁵⁸ Christopher J. Castelli, “CNO: Air-Sea Battle Driving Acceleration Of Key Programs In POM-14,” *Inside the Navy*, August 20, 2012. POM-14 is the Program Objective Memorandum (an internal DOD budget-planning document) for the FY2014 DOD budget.

And it's reasonably safe to assume if there's a new missile out there, it's Chinese....

To be clear, nobody outside the Navy knows for sure what's got the sailing branch so startled. Until the Navy discloses exactly what the threat is, everyone will be guessing. Besides China, the other players in this scenario are, of course, Russia, Iran and North Korea.¹⁵⁹

A July 28, 2013, blog post states that

The U.S. Navy has asked missile manufacturers to quickly design and build them a target drone that will simulate sub-sonic Chinese anti-ship missiles. Previously the U.S. Navy had spent a lot of effort developing and building similar drones to simulate super-sonic anti-ship missiles. Apparently someone did the math and realized that the most likely near-term opponents (China, North Korea, or Iran) all had a lot of Chinese sub-sonic missiles.¹⁶⁰

Training and Forward-Deployed Operations

The Navy in recent years has increased antisubmarine warfare (ASW) training for Pacific Fleet forces and conducted various forward-deployed operations in the Western Pacific, including exercises and engagement operations with Pacific allied and partner navies, as well as operations that appear to have been aimed at monitoring Chinese military operations.¹⁶¹

In a December 2011 journal article, Admiral Jonathan Greenert, the Chief of Naval Operations, stated:

Critical to shaping the environment is cooperation with partners and allies across the range of operations. At the high end [of operations], we will expand our combined efforts with allies in Japan, South Korea, and Australia to train and exercise in missions such as antisubmarine warfare and integrated air and missile defense. Over the next decade, we will also increase deployments of ships and aircraft for the cooperative missions our other allies and partners need most. Our ships ships [sic] in Singapore will conduct cooperative counterpiracy or countertrafficking operations around the South China Sea. Similarly, 2025 may see [land-based] P-8A Poseidon [maritime patrol] aircraft or unmanned broad area maritime surveillance aerial vehicles periodically deploy to the Philippines or Thailand to help those nations with maritime domain awareness....

As Secretary of State Hillary Clinton noted in a recent *Foreign Policy* article, the Asia-Pacific region will be emphasized in our forward posture.... We will continue our robust

¹⁵⁹ "Mystery Weapon Terrifies America's Admirals," *War is Boring* (<https://medium.com/war-is-boring>), July 13, 2013, accessed September 5, 2013, at <https://medium.com/war-is-boring/9b7312dc7bf5>. See also John Keller, "ITT Exelis To Help Navy With New EW System To Protect Ships From Recently Discovered Threat," *Military and Aerospace Electronics* (www.militaryaerospace.com), July 9, 2013, accessed September 5, 2013, at <http://www.militaryaerospace.com/articles/2013/07/itt-shipboard-ew.html>.

¹⁶⁰ James Dunnigan, "U.S. Navy Hurries Preparations For War With China," *Strategy Page* (www.strategypage.com), July 28, 2013, accessed September 5, 2013, at <http://www.strategypage.com/dls/articles/U.S.-Navy-Hurries-Preparations-For-War-With-China-7-28-2013.asp>.

¹⁶¹ Incidents at sea in recent years between U.S. and Chinese ships and aircraft in China's Exclusive Economic Zone (EEZ) (see "China's View Regarding Right to Regulate Foreign Military Activities in EEZ" in "Background") appear to involve, on the U.S. side, ships and aircraft, such as TAGOS ocean surveillance ships and EP-3 electronic surveillance aircraft, whose primary apparent mission is to monitor foreign military operations.

rotational deployments to the western Pacific, complemented with our forward-stationed navy and marine forces in Japan, Guam, Singapore, and Australia.¹⁶²

A July 2, 2013, blog post states that

The U.S. Navy's multi-national exercises in the Pacific theater are growing in size and taking on new dimensions due to the U.S. military's overall strategic re-balance or "pivot" to the region, service officials explained.

Although many of the multi-national exercises currently underway have been growing in recent years, the U.S. military's strategic focus on the area is having a profound impact upon training activities there, Navy officials acknowledge....

"The Pacific re-balance is allowing us to do things we have not been able to do in the past. Some of our allies were looking for something a little more compatible with what they had. The LCS [Littoral Combat Ship] allows us to better train and adapt to our partner navies who have been operating smaller, shallow-draft platforms for years," said [Lt. Anthony] Falvo [spokesman, U.S. Pacific Fleet].¹⁶³

Statements of Confidence

Countering China's naval modernization effort can also involve stating publicly (while withholding classified details) the U.S. Navy's ability to counter improved Chinese maritime forces. Such public statements could help prevent Chinese overconfidence that might lead to incidents, while also reassuring regional allies, partners, and neutrals. Conversely, some observers might argue, having an ability to counter Chinese maritime military forces but not stating it publicly could invite Chinese overconfidence and thereby be destabilizing. A February 1, 2011, press report stated:

U.S. military commanders are expressing confidence that they can hold their own in the face of faster-than-expected advances by China's military, but looming cost cuts are adding to doubts about the future of American power in the Pacific....

In an interview from an office at the Washington Navy Yard, a military base in the nation's capital, the top Navy commander said the military had plans in place to cope with advances in China, and elsewhere. "We're not flat footed" in the response to China, Admiral Gary Roughead told Reuters.

"I would say that we are responding, or advancing, our capabilities in such a way that we're pacing the global developments that are taking place," he said.

"That includes Chinese advances, it includes developments that are taking place in other parts of the world as well."¹⁶⁴

A December 2010 press report stated:

¹⁶² Jonathan Greenert, "Navy, 2025: Forward Warfighters," *U.S. Naval Institute Proceedings*, December 2011: 20.

¹⁶³ Kris Osborn, "Navy Pivots Training to Match Pacific Transition," *DOD Buzz* (www.dodbuzz.com), July 2, 2013.

¹⁶⁴ Phil Stewart, "U.S. Military Says Keeps Up With China; Is It Enough?" *Reuters.com*, February 1, 2011.

The man who would face the Chinese in battle, Adm. Patrick Walsh, the current commander of the U.S. Navy's Pacific Fleet, sees preparation as a way to avoid a future fight. "When we look at these sorts of [Chinese military] developments, such as the ASBM, they are technological developments that we respect, but do not necessarily fear," Walsh says. "The key element in any sort of deterrent strategy is to make it clear to those who would use a given piece of technology that we have the means to counter it, and to maintain a technological edge."¹⁶⁵

One observer stated in 2009 that

It is time for the national security community to get a grip on itself. The AA/AD [anti-access/area-denial] threat is neither new nor all that daunting. The U.S. military has already faced down the mother of all AA/AD threats. It was the Soviet military. The Red Army was postured for the ultimate AA/AD operation, including a massive air and missile assault—employing chemical weapons—on all our forward bases and using hundreds of submarines and aircraft to sweep the seas of our ships. The AA/AD Cassandras are hyping today's threat. Equally bad, they are forgetting recent history.

The U.S. military will employ a full sweep of technologies, tactics and techniques to counter the AA/AD threat. As my colleague Loren Thompson pointed out... a few weeks ago the U.S. Navy has ways of addressing the anti-shipping ballistic missile threat. Advanced organic mine warfare capabilities are being developed to counter sea mines. The Air Force will employ a combination of airfield defenses, electronic warfare, SEAD [suppression of enemy air defenses], unmanned systems, long-range precision weapons and most important, stealthy aircraft to defeat the AA/AD threat. There is an AA/AD threat, but it is not an apocalyptic danger.¹⁶⁶

Issues for Congress

Future Size of U.S. Navy

One potential oversight issue for Congress, particularly in the context of reductions in planned levels of defense spending that are anticipated as a result of the Budget Control Act of 2011 (S. 365/P.L. 112-25 of August 2, 2011), concerns whether the U.S. Navy in coming years will be large enough to adequately counter improved Chinese maritime anti-access forces while also adequately performing other missions around the world of interest to U.S. policymakers. Some observers are concerned that a combination of growing Chinese naval capabilities and budget-driven reductions in the size of the U.S. Navy could encourage Chinese military overconfidence and demoralize U.S. allies and partners in the Pacific, and thereby destabilize or make it harder for the United States to defend its interests in the region.¹⁶⁷

¹⁶⁵ Erik Sofge, "China's Deadliest Game," *Popular Mechanics*, December 2010: 83.

¹⁶⁶ Daniel Goure, "The Overblown Anti-Access, Area Denial Threat," Lexington Institute Early Warning Blog, October 23, 2009, accessed at <http://www.lexingtoninstitute.org/the-overblown-anti-access-area-denial-threat?a=1&c=1171>.

¹⁶⁷ See, for example, Seth Cropsey, "China's Growing Challenge To U.S. Naval Power," *Wall Street Journal*, June 21, 2013: 13; Dan Blumenthal and Michael Mazza, "Asia Needs a Larger U.S. Defense Budget," *Wall Street Journal*, July 5, 2011; J. Randy Forbes, "Defence Cuts Imperil US Asia Role," *The Diplomat* (<http://the-diplomat.com>), October 26, 2011. See also Andrew Krepinevich, "Panetta's Challenge," *Washington Post*, July 15, 2011: 15; Dean Cheng, *Sea Power and the Chinese State: China's Maritime Ambitions*, Heritage Foundation Backgrounder No. 2576, July 11, 2011, p. 10.

Navy officials state that, to carry out Navy missions around the world in coming years, the Navy will need to achieve and maintain a fleet of 306 ships of various types and numbers. The Navy's FY2014 30-year (FY2014-FY2043) shipbuilding plan, however, does not include enough ships to fully support all elements of the Navy's 306-ship goal over the long run. The Navy projects that if the FY2014 30-year plan were implemented, there would be shortfalls in cruisers-destroyers, attack submarines, and amphibious ships at certain points during the 30-year period.¹⁶⁸ As cost-saving measures, the Navy's FY2014 budget proposes the early retirement in FY2015 of seven Aegis cruisers, the shifting into reduced operation status (ROS) of two amphibious ships, and the deferral of some planned ship procurements. A similar proposal made by the Navy in its FY2013 budget submission was not accepted by Congress.¹⁶⁹

The Navy's 306-ship goal reflects the defense strategic guidance document that the Administration presented in January 2012 (see "January 5, 2012, Strategic Guidance Document" above) and the associated projected levels of DOD spending shown in the FY2013 budget submission. DOD officials have stated that if planned levels of DOD spending are reduced below what is shown in the FY2013 budget submission, the defense strategy set forth in the January 2012 strategic guidance document might need to be changed. Such a change, Navy officials have indicated, could lead to the replacement of the 306-ship plan of January 2013 with a new plan.

On March 18, 2013, DOD announced that it had initiated a "Strategic Choices and Management Review" that was to be completed by May 31, 2013. A DOD statement on the review reportedly stated:

"Last week, Secretary Hagel directed senior leaders to conduct a review to examine the choices that underlie the Department of Defense's strategy, force posture, investments, and institutional management—including all past assumptions, systems, and practices. This Strategic Choices and Management Review will define the major decisions that must be made in the decade ahead to preserve and adapt our defense strategy, our force, and our institutions under a range of future budgetary scenarios," [DoD Press Secretary George] Little said.

The new strategy will "frame the Secretary's guidance for the Fiscal Year 2015 budget and will ultimately be the foundation for the Quadrennial Defense Review due to Congress in February 2014."

Deputy Secretary Ash Carter, Dempsey and the Joint Chiefs will conduct the review, which is to be completed by May 31.¹⁷⁰

A June 4, 2013, press report stated:

¹⁶⁸ For additional discussion, see CRS Report RL32665, *Navy Force Structure and Shipbuilding Plans: Background and Issues for Congress*, by Ronald O'Rourke.

¹⁶⁹ For a discussion, see CRS Report RL32665, *Navy Force Structure and Shipbuilding Plans: Background and Issues for Congress*, by Ronald O'Rourke.

¹⁷⁰ As quoted in Colin Clark, "CJCS Gen. Dempsey Signals Strategy Change; Cites Sequestration, Decline Of State Power, Technology Spread," AOL Defense (<http://defense.aol.com>), March 18, 2013, accessed March 21, 2013, at <http://defense.aol.com/2013/03/18/cjcs-gen-dempsey-signals-strategy-change-touts-decline-of-stat/>. See also Jim Garamone, "Hagel Tasks Civilian, Military Leaders to Examine Strategy," DOD News, March 18, 2013, accessed March 21, 2013 at <http://www.defense.gov/news/newsarticle.aspx?id=119557>; and Marcus Weisgerber, "DoD Reviewing Strategy in Wake of Budget Cuts," *NavyTimes.com*, March 18, 2013, accessed March 21, 2013, at <http://www.navytimes.com/news/2013/03/ap-chuck-hagel-orders-review-defense-strategy-031813/>.

The Pentagon pushed back against Capitol Hill critics saying a major military strategy review is not delayed, but proceeding on its original time line.

The services completed their recommendations for the Strategic Choices and Management Review (SCMR) on May 31 as originally outlined in Defense Secretary Chuck Hagel's March 15 memo chartering the exercise, Lt. Col. Elizabeth Robbins, a Pentagon spokeswoman, said Tuesday.

Hagel will factor the recommendations into the Pentagon's 2015 budget guidance....

Throughout the SCMR process, DoD officials have been vague about the actual end product of the review other than to say it will inform the 2015 budget and be the foundation for the 2014 Quadrennial Defense Review. These officials have said the inputs will give them options for areas to cut under a range of budget scenarios....

Pentagon sources have said they had no plans to formally roll out the service's SCMR inputs, however, further details about how long-term budget cuts would impact DoD are likely to emerge over the next month.¹⁷¹

DOD officials have stated that notwithstanding reductions in planned levels of U.S. defense spending, the U.S. strategic rebalancing toward the Asia-Pacific region will remain on track.¹⁷² Admiral Jonathan Greenert, the Chief of Naval Operations, has stated that the planned shift of Navy assets to the Pacific will take place regardless of reductions to Navy spending resulting from sequestration.¹⁷³

Potential oversight questions for Congress include the following:

- Under the Administration's plans, will the Navy in coming years be large enough to adequately counter improved Chinese maritime anti-access forces while also adequately performing other missions around the world of interest to U.S. policymakers?
- What might be the political and security implications in the Asia-Pacific region of a combination of growing Chinese naval capabilities and budget-driven reductions in the size of the U.S. Navy?
- How might the planned size of the Navy, the Navy's share of DOD resources, and the U.S. strategic rebalancing toward the Asia-Pacific region be affected by the Strategic Choices and Management Review?
- If the Navy is reduced in size, and priority in the allocation of deployed Navy ships is given to maintaining Navy forces in the Pacific, what will be the impact on Navy force levels in other parts of the world, such as the Persian Gulf/Indian Ocean region or the Mediterranean Sea, and consequently on the Navy's ability to adequately perform its missions in those parts of the world?

¹⁷¹ Marcus Weisgerber, "DoD: Strategic Review on Track," *DefenseNews.com*, June 4, 2013.

¹⁷² See, for example, Paul Eckert, "Asia Rebalance Remains U.S. Priority Amid Fiscal Woes: Pentagon," *Reuters.com*, February 27, 2013, which quotes Mark Lippert, Assistant Secretary of Defense for Asian and Pacific Security Affairs.

¹⁷³ See, for example, Megan Eckstein, "Greenert: Pacific Shift Will Take Place Regardless Of Sequestration," *Inside the Navy*, February 25, 2013.

- To what extent could the operational impacts of a reduction in Navy ship numbers be mitigated through increased use of forward homeporting, multiple crewing, and long-duration deployments with crew rotation (i.e., “Sea Swap”)? How feasible are these options, and what would be their potential costs and benefits?
- Particularly in a situation of constrained DOD resources, if enough funding is allocated to the Navy to permit the Navy in coming years to maintain a fleet of about 306 ships of the types and numbers set forth in the Navy’s 306-ship goal, how much would other DOD programs need to be reduced, and what would be the operational implications of those program reductions in terms of DOD’s overall ability to counter improved Chinese military forces and perform other missions?

Air-Sea Battle Concept

Another potential oversight issue for Congress concerns the sufficiency of information given to Congress about the Air-Sea Battle concept, and whether implementing the concept would create an increased risk escalation in a U.S.-China crisis or conflict.

In a November 7, 2011, letter to Secretary of Defense Panetta, Representative J. Randy Forbes, the chairman of the Readiness subcommittee of the House Armed Services Committee, stated in part:

Despite reports throughout 2011 that AirSea Battle had been completed in an executive summary form, to my knowledge Members of Congress have yet to be briefed on its conclusions or in any way made a part of the process. This support will be critical if this concept is to be both properly resourced and enduring....

... I believe the development of this operational concept, like AirLand Battle during the late 1970s and early 1980s, will require the support of Congress if it is to be both successful and enduring. As you will recall, after AirLand Battle was finalized in 1980 the Army worked to build a consensus around the effort, first within the Department and then with Members of Congress through a series of briefings. These briefings described the doctrine and the weapons coming into production that would form the basis of this major doctrinal transition. With Congress’ support, AirLand Battle received the proper resources that led to a revolution in the way America’s Army and Air Force conducted joint operations. If AirSea Battle is to have similar success, the Congress will have to be made a full partner of this effort.

As AirSea Battle moves from the development stage to implementation, I am eager to understand how you plan to make Congress part of this process. More specifically, what is the overall fiscal program required to support the basic concept? In the short term, I would also appreciate a brief to better understand the findings of the Department’s two-year effort to comprehend the challenges created by sophisticated A2/AD [anti-access/area-denial] environments and the operational and tactical demands that will be required to sustain our freedom of action in these theaters.¹⁷⁴

¹⁷⁴ Letter dated November 7, 2011, from Representative J. Randy Forbes to the Honorable Leon Panetta, accessed November 30, 2011, at http://forbes.house.gov/UploadedFiles/Panetta_ASB.pdf. The letter was also posted at *InsideDefense.com* (subscription required) on November 18, 2011. See also Megan Eckstein, “Forbes Asks Pentagon For Details On New AirSea Battle Office,” *Inside the Navy*, November 21, 2011.

On June 3, 2013, DOD released an unclassified summary of the ASB Concept; the document builds on earlier statements from DOD officials on the topic. DOD's unclassified summary of the ASB document is reprinted in **Appendix A**.

A July 27, 2013, press report stated:

Hardly a week passes in the defense world without the appearance of some news article, a speech or a panel discussion trying to explain what the Pentagon's Air-Sea Battle (ASB) concept is all about.

It's an operational concept, a tactical battle plan, a political ploy to convince the Chinese they can't compete militarily with the US. It's likely to be costly, it will help reduce spending. It will deter aggression, it will lead to nuclear war.

Often, the discussions feature declarations of what Air-Sea Battle is not. It's not about China, it's not about a specific threat. It's not a new version of the 1980s-era Air-Land Battle plan. It does not have a specific budget. It's not just about its database of military assets.

Four years after the concept was conceived, three years after a major monograph described it, two years after a special office was set up in the Pentagon, Air-Sea Battle remains an enigma....

A jargon-laden Pentagon briefing in November 2011 to announce the creation—three months after the fact—of an Air-Sea Battle office did little to help. Many of the media stories from the briefing cast the concept solely as a plan to attack China, even though briefers strove to discourage that idea.

A seminal monograph in 2010 from the Center for Strategic and Budgetary Assessments (CSBA), a Washington think tank, only bolstered the impression that Air-Sea Battle was all about China....

Some critics have charged that the Air-Sea Battle concept is driving China to increase its A2AD capabilities, often pointing to recently fielded weapons that could threaten US aircraft carriers. [Jan van Tol, the principal author of the CSBA report] scoffs at the notion that such developments are driven by Air-Sea Battle.

"China has been trying to field those capabilities well before ASB," he observed. "Interest in ASB did not trigger Chinese interest in fielding these systems."

A leading critic of the concept feels otherwise.

Air-Sea Battle is designed to "break" China, said Amitai Etzioni, a professor of international affairs at George Washington University (GWU) in Washington, who frequently writes and speaks about the concept.

"The strategy requires going in to the Chinese mainland, because that's where the anti-ship missiles are," Etzioni told Defense News. "The ASB requires you to go into the Chinese mainland. And that leads to a major confrontation."...

Within the Air-Sea Battle office itself, the discussion—at least to outsiders—today centers on the interservice cooperation and integration the concept is attempting to foster.¹⁷⁵

On April 29, 2013, one observer stated:

Air-Sea Battle (ASB) has become a much-debated Pentagon concept to counter China's anti-access/area-denial challenge. Yet while allies welcomed America's military "rebalance" toward Asia, they wonder what it means in concrete terms.

ASB is no exception. Indeed, uncertainties surrounding the concept have led to an image problem even among close allies, such as Australia. It's time for detailed debate between the US and its allies about what ASB is and isn't, what it is supposed to achieve, and what role the allies could and want to play.

The uncertainties stem largely from the fact that ASB remains classified. This not only leaves allies wondering what the US expects from them, but its China dimension significantly raises the stakes. While US officials insist that ASB is not country-specific, everyone in Asia knows who is the major potential adversary for US forces.

Bluntly speaking, the US military is planning how to fight a future war with China without fully consulting its allies.

In an allied context, this situation is unfortunate and risky. Unfortunate since ASB has the potential to make a positive contribution to a changing Asia-Pacific strategic environment. It signals to China America's intention and willingness to project military power into maritime zones increasingly contested by the People's Liberation Army (PLA).

Any Chinese leader would need to calculate the possibility and nature of a US reaction in response to a major military action designed to change the status quo in the western Pacific. ASB, therefore, could strengthen the credibility of US conventional deterrence in Asia and reassure allies and partners.

Yet ASB's potential to enhance regional stability is largely lost amid the lack of clarity of what the concept entails and how it links military strategy to broader US political objectives in Asia.

The result is an image problem of ASB as the military element of an emerging US containment strategy vis-à-vis China. Such views certainly do not reflect actual US China policy. But the US needs to better explain how the concept aligns with the US strategic framework for dealing with China's rise, or allies will perceive a disconnect between US military doctrine and overall strategy.

Washington also needs to more clearly explain ASB to Beijing—the emergence of a military strategy designed to counter China's growing strength hasn't gone unnoticed there.

Future high-level talks between Pentagon and PLA officials should particularly focus on the relationship between ASB and nuclear escalation.

US advocates of ASB argue that in the event of conflict, escalation could be kept at the conventional level. That is a dangerous proposition, given that the concept entails deep

¹⁷⁵ Christopher P. Cavas, "Defining Air-Sea Battle," *DefenseNews.com*, July 27, 2013.

penetration of Chinese territory to destroy and disrupt PLA command-and-control nodes used for conventional operations.

Beijing might well perceive such attacks as American attempts to disarm China's nuclear deterrent, and could thus be tempted to nuclear pre-emption.

Put differently, minimizing the risk of nuclear escalation requires a very nuanced understanding on the part of China's strategic decision-makers that ASB's conventional response reflects an "escalation ladder" designed to avoid a catastrophic nuclear exchange. Without mutual US-Sino understanding about the need for a new concept of strategic stability, conventional strikes on the Chinese mainland in the context of ASB appear to be a very risky proposition.

It also is risky to assume that ASB is the silver bullet for all Asian allies facing China's military challenge. It's not. The concept appears optimized for deterring a high-intensity conventional war between China and the US and its allies in East Asia, extreme cases such as PLA attacks on Taiwan or US bases in Japan. Not surprisingly, Taiwan and Japan, front-line states in the emerging US-Sino strategic competition, are the most supportive of ASB.

However, because it's a big stick, ASB will probably be far less effective against small-scale Chinese aggression, such as coercive military actions in maritime territorial disputes, where the stakes are small enough to (probably) avoid high levels of escalation. The US is thus still searching for a credible deterrence strategy for such cases.

That's why Southeast Asian allies are much more ambivalent when it comes to ASB, and the US would be ill-advised to take their participation for granted.

Even close ally Australia does not see the benefit in openly signing up to a concept that so far raises more questions than providing answers to its security problems.

The Pentagon needs to do much more to persuade allies that ASB is the right response to China's military challenge. A declassified allied version of ASB would be a very good start.¹⁷⁶

On August 2, 2013, another observer stated:

Air-Sea Battle proponents are right to highlight the growing vulnerability of forward-deployed U.S. forces and right to enhance interservice collaboration. But civilian and military leaders alike need to understand that Air-Sea Battle suggests the United States would strike China before China strikes U.S. forces. That could precipitate a spiraling, costly, and destabilizing arms race and make a crisis more likely to lead to hostilities. The United States needs options to facilitate crisis management, deter aggression, and protect U.S. forces that do not require early attacks on Chinese territory.

Here we suggest two: Shift toward a more survivable force posture in East Asia and improve the means to prevent China—or any state – from projecting force in an act of international aggression....

Disrupting or destroying China's kill-chain is alluring. China has the resources to threaten U.S. forces in the Pacific. Failure to develop countermeasures would leave the United States with a declining ability to operate militarily, deter Chinese use of force, reassure and defend

¹⁷⁶ Ben Schreer, "Clarify Air-Sea Battle; Asian Allies Warily Mull US Strategy," *DefenseNews.com*, April 29, 2013.

allies, and exert influence in a vital region. Yet this simple idea could have dire consequences: Air-Sea Battle's targets would have to be struck before they could do significant damage to U.S. forces. With the exception of ships at sea and satellites in orbit, the targets that comprise China's kill-chain—air and naval bases, missile launchers, land-based sensors, command-and-control centers—are in China itself.

Attacking Chinese territory would have serious geopolitical consequences. China isn't the menacing, isolated Soviet Union. It's a huge and integral part of the world economy, as well as a potential U.S. partner in managing world affairs....

Given all these concerns, what does Air-Sea Battle contribute to U.S. security? It could indeed present China's military with serious problems. The kill-chain on which its A2/AD strategy depends is complex, fragile, and vulnerable to physical attacks and cyberattacks. By disabling this chain, Air-Sea Battle could buy space, time, and security for the use of existing U.S. strike forces. Or, as the Chinese see it, Air-Sea Battle could render China extremely vulnerable to U.S. attack.

At the same time, Air-Sea Battle does not solve the underlying problem of U.S. forces' growing vulnerability in the Western Pacific. That is the result of military-technological trends, geographic realities, and the limitations and costs of defending overseas deployments. Each factor favors A2/AD. Air-Sea Battle could provide a stopgap countermeasure until the United States can address its vulnerability. But it also has the potential to deepen Chinese fears of U.S. intentions, cause the Chinese to re-double their A2/AD effort—which they see as essential for national defense—and even make conflict more likely. Importantly, the advent of Air-Sea Battle should not divert the United States from developing other capabilities that could serve the same ends without destabilizing Sino-U.S. relations....

Air-Sea Battle increases the odds that a crisis will turn violent. Already, the Chinese People's Liberation Army (PLA) leans toward early strikes on U.S. forces if hostilities have begun or appear imminent (this inclination is a first premise of the Air-Sea Battle concept). Given that, to be most effective, Air-Sea Battle would need to take down Chinese targeting and strike capabilities before they could cause significant damage to U.S. forces and bases. It follows, and the Chinese fear, that such U.S. capabilities are best used early and first—if not preemptively, then in preparation for further U.S. offensive action. After all, such U.S. strikes have been used to initiate conflict twice in Iraq. This perception will, in turn, increase the incentive for the PLA to attack preemptively, before Air-Sea Battle has degraded its ability to neutralize the U.S. strike threat. It could give the Chinese cause to launch large-scale preemptive cyber- and anti-satellite attacks on our Air-Sea Battle assets. Indeed, they might feel a need, out of self-defense, to launch such attacks even if they had not planned to start a war. It is a dangerous situation when both sides put a premium on early action....

We simply do not understand well enough how cyberwar with China would unfold and whether it could be contained. Strategies that encourage mutual restraint rather than early offensive action in this unfamiliar strategic domain may ultimately be advantageous to the United States.

Most distressing, from a strategic perspective, is that Air-Sea Battle addresses how a war with China could begin, but it begs the questions of what course such a war could take, where it would lead, and how it could be ended on terms favorable to the United States. It is one thing to attack Iraq or Libya (or even Iran). It's quite another to attack the world's second most powerful state.

So what steps *should* the United States take to counter China's growing A2/AD arsenal? Air-Sea Battle capabilities are worth pursuing, but they cannot be the entirety of our military posture. The United States needs options that facilitate crisis management, deter aggression,

and sustain U.S. force survivability without requiring early attacks on Chinese territory. (Those should be a last resort, not the first.) To that end, we propose shifting toward a more

survivable force posture in East Asia. We also suggest developing America's own A2/AD capabilities, thus its ability to prevent China—or any other hostile state—from projecting force.

A more sustainable and less destabilizing way to solve the vulnerability problem is to overwhelm and confuse China's targeting, which is the key to its A2/AD. Because forces that could do this would pose a significant threat without placing a premium on deep, early strikes, and because striking them in a comprehensive way would be very difficult and risky, they would add to stability rather than detract from it. Taking full advantage of information technology, the United States should shift toward such forces—more distributed, networked, numerous, diverse, elusive, small, long-range, and hard-to-find – while also exploiting two promising counter-offensive technologies: drones and cyberweapons. A more survivable U.S. posture along these lines would discourage Chinese preemptive attack, obviate the need for deep, early U.S. attacks, and allow time for a crisis to be defused....

To complement a shift toward less targetable, more survivable forces, the United States should develop a strategy to defeat force projection by regional powers, of which China is the strongest but obviously not the only candidate. A2/AD works in both directions. If the United States (and its partners and allies) can use defensive measures to prevent international aggression, and if it is finding it increasingly difficult and costly to overcome the A2/AD of lesser powers, then it should turn the tables on those powers. To clarify, if preventing international aggression was the main reason for the United States to use force—lesser ones being regime change, counterinsurgency, and humanitarian intervention—then U.S. defense strategy should concentrate on it. Capabilities to counter force projection by regional aggressors would give the United States options to deter them, to provide time and space to defuse crises short of war, and to prevail militarily without necessarily firing the first shot or immediately escalating to attacks on an adversary's homeland. Partnerships with allies to develop their A2/AD capabilities would be critical in this plan.

To bring such a strategy to fruition, all U.S. military services, along with combatant commanders, would have to develop operational concepts not confined by current doctrine and force structure. Honing U.S. capabilities for regional A2/AD would exploit targeting technologies in which the U.S. military has and can retain superiority. The capabilities that come immediately to mind include anti-air, cyberwar, anti-naval forces, and C4ISR—most of which exist in U.S. inventories and are undergoing continuous improvement. Furthermore, working to improve the defense forces of allies and partners would be a central element of such an approach. Other regional A2/AD capabilities worth considering (and more controversially) include new capabilities, such as land-based anti-ship missiles.

If the United States relied more on A2/AD capabilities of its own and its partners to prevent aggression, escalation would no longer be an urgent imperative; it could be undertaken only when no other good options remained. The United States could rely on regional partners to deploy their own A2/AD capabilities at the onset of trouble, while withholding its A2/AD measures until aggression was underway or certain. This would reduce both tensions before crises develop and the need to attack first. It would also permit time to defuse crises on favorable terms. Where China is concerned, a U.S. posture that is more clearly geared toward defeating international aggression, while also more survivable (and almost certainly less expensive), is less likely to stoke fear, distrust, and temptations to preempt than one that

depends on attacking China at the outset of a conflict. The shift in emphasis to regional A2/AD would improve deterrence without raising the risks of escalation.¹⁷⁷

Navy's Ability to Counter China's ASBMs

Another potential oversight issue for Congress concerns the Navy's ability to counter China's ASBMs. Although China's projected ASBM, as a new type of weapon, might be considered a "game changer," that does not mean it cannot be countered. There are several potential approaches for countering an ASBM that can be imagined, and these approaches could be used in combination. The ASBM is not the first "game changer" that the Navy has confronted; the Navy in the past has developed counters for other new types of weapons, such as ASCMs, and is likely exploring various approaches for countering ASBMs.

Breaking the ASBM's Kill Chain

Countering China's projected ASBMs could involve employing a combination of active (i.e., "hard-kill") measures, such as shooting down ASBMs with interceptor missiles, and passive (i.e., "soft-kill") measures, such as those for masking the exact location of Navy ships or confusing ASBM reentry vehicles. Employing a combination of active and passive measures would attack various points in the ASBM "kill chain"—the sequence of events that needs to be completed to carry out a successful ASBM attack. This sequence includes detection, identification, and localization of the target ship, transmission of that data to the ASBM launcher, firing the ASBM, and having the ASBM reentry vehicle find the target ship.

Attacking various points in an opponent's kill chain is an established method for countering an opponent's military capability. A September 30, 2011, press report, for example, quotes Lieutenant General Herbert Carlisle, the Air Force's deputy chief of staff for operations, plans, and requirements, as stating in regard to Air Force planning that "We've taken [China's] kill chains apart to the 'nth' degree."¹⁷⁸ In an interview published on January 14, 2013, Admiral Jonathan Greenert, the Chief of Naval Operations, stated:

In order for one to conduct any kind of attack, whether it is a ballistic missile or cruise missile, you have got to find somebody. Then, you have got to make sure it is somebody you want to shoot. Then, you've got to track it, you've got to hold that track. Then, you deliver the missile. We often talk about what I would call hard kill—knocking it down, a bullet on a bullet—or soft kill; there is jamming, spoofing, confusing; and we look at that whole spectrum of operations.

And frankly, it is cheaper in the left-hand side of that spectrum.¹⁷⁹

To attack the ASBM kill chain, Navy surface ships, for example, could operate in ways (such as controlling electromagnetic emissions or using deception emitters) that make it more difficult for

¹⁷⁷ David Gompert and Terrence Kelly, "Escalation Clause," *Foreign Policy.com*, August 2, 2013. See also David C. Gompert and Terrence K. Kelly, "U.S., China And An Unthinkable War," *LA Times.com*, August 26, 2013.

¹⁷⁸ David A. Fulghum, "USAF: Slash And Burn Defense Cuts Will Cost Missions, Capabilities," *Aerospace Daily & Defense Report*, September 30, 2011: 6.

¹⁷⁹ "Interview: Adm. Jon Greenert," *Defense News*, January 14, 2013: 30. The reference to "the left-hand side of that spectrum" might be a reference to soft kill measures.

China to detect, identify, and track those ships.¹⁸⁰ The Navy could acquire weapons and systems for disabling or jamming China's long-range maritime surveillance and targeting systems, for attacking ASBM launchers, for destroying ASBMs in various stages of flight, and for decoying and confusing ASBMs as they approach their intended targets. Options for destroying ASBMs in flight include developing and procuring improved versions of the SM-3 BMD interceptor missile (including the planned Block IIA version of the SM-3), accelerating the acquisition of the Sea-Based Terminal (SBT) interceptor (the planned successor to the SM-2 Block IV terminal-phase BMD interceptor),¹⁸¹ accelerating development and deployment of the electromagnetic rail gun (EMRG), and accelerating the development and deployment of shipboard high-power free electron lasers (FELs) and solid state lasers (SSLs). Options for decoying and confusing ASBMs as they approach their intended targets include equipping ships with systems, such as electronic warfare systems or systems for generating radar-opaque smoke clouds, that could confuse an ASBM's terminal-guidance radar.¹⁸² One observer has argued that active defenses alone are unlikely to succeed, and that the U.S. Navy should place stronger emphasis on passive defenses.¹⁸³

AAW and BMD Capability of Flight III DDG-51 Destroyer

In assessing the Navy's ability to counter China's ASBMs, a potentially important question that Congress may consider is whether the Flight III version of the DDG-51 destroyer—the version that the Navy wants to procure starting in FY2016—would have sufficient AAW and BMD capability to perform projected air and missile defense missions against Chinese forces, including ASBMs.

The Flight III DDG-51 would have more AAW and BMD capability than the current DDG-51 design, but less AAW and BMD capability than was envisioned for the CG(X) cruiser (a ship acquisition program that the Navy eventually canceled), in large part because the Flight III DDG-51 would be equipped with a 14-foot-diameter version of the AMDR that would have more sensitivity than the SPY-1 radar on Flight IIA DDG-51s, but less sensitivity than the substantially

¹⁸⁰ For a journal article discussing actions by the Navy during the period 1956-1972 to conceal the exact locations of Navy ships, see Robert G. Angevine, "Hiding in Plain Sight, The U.S. Navy and Dispersed Operations Under EMCON, 1956-1972," *Naval War College Review*, Spring 2011: 79-95. See also Jonathan F. Sullivan, *Defending the Fleet From China's Anti-Ship Ballistic Missile: Naval Deception's Roles in Sea-Based Missile Defense*, A Thesis submitted to the Faculty of the Graduate School of Arts and Sciences of Georgetown University in partial fulfillment of the requirements for the degree of Master of Arts in Security Studies, April 15, 2011, accessed August 10, 2011 at <http://gradworks.umi.com/1491548.pdf>.

¹⁸¹ For more on the SM-3, including the Block IIA version, and the SBT, see CRS Report RL33745, *Navy Aegis Ballistic Missile Defense (BMD) Program: Background and Issues for Congress*, by Ronald O'Rourke.

¹⁸² Regarding the option of systems for generating radar-opaque smoke clouds, Thomas J. Culora, "The Strategic Implications of Obscurants," *Naval War College Review*, Summer 2010: 73-84; Scott Tait, "Make Smoke!" *U.S. Naval Institute Proceedings*, June 2011: 58-63.

¹⁸³ Marshall Hoyer, "China's 'Antiaccess' Ballistic Missiles and U.S. Active Defense," *Naval War College Review*, Autumn 2010: 84-105.

For additional discussions of options for countering ASBMs, see Sam J. Tangredi, "No Game Changer for China," *U.S. Naval Institute Proceedings*, February 2010: 24-29; and Loren B. Thompson, "China's New 'Carrier-Killing' Missile Is Overrated," Lexington Institute (Early Warning Blog), August 9, 2010 (available online at <http://www.lexingtoninstitute.org/chinas-new-carrier-killing-missile-is-overrated?a=1&c=1171>). See also Craig Hooper and Christopher Albon, "Get Off the Fainting Couch," *U.S. Naval Institute Proceedings*, April 2010: 42-47; and Duncan Lennox, "China's ASBM Project: Keep Calm and Carry On," *Jane's Defence Weekly*, February 16, 2011: 23.

larger version of the AMDR that was envisioned for the CG(X). The CG(X) also may have had more missile-launch tubes than the Flight III DDG-51.

The Navy argues that while the version of the AMDR on the Flight III DDG-51 will have less sensitivity than the larger version of the AMDR envisioned for the CG(X), the version of the AMDR on the Flight III DDG-51 will provide sufficient AAW and BMD capability to address future air and missile threats. A March 2013 Government Accountability Office (GAO) report assessing selected DOD acquisition programs stated:

The Navy plans to install a 14-foot variant of AMDR on Flight III DDG 51s starting in 2019. According to draft AMDR documents, a 14-foot radar is needed to meet threshold requirements, but an over 20-foot radar is required to fully meet the Navy's desired integrated air and missile defense needs. However, the shipyards and the Navy have determined that a 14-foot active radar is the largest that can be accommodated within the existing DDG 51 deckhouse. Navy officials stated that AMDR is being developed as a scalable design but a new ship would be required to host a larger version of AMDR....

The X-band portion of AMDR will be comprised of an upgraded version of an existing rotating radar (SPQ-9B), instead of the new design initially planned. The new radar will instead be developed as a separate program at a later date and integrated with the 13th AMDR unit. According to the Navy, the SPQ-9B radar fits better within the Flight III DDG 51's sea frame and expected power and cooling. While program officials state that the upgraded SPQ-9B radar will have capabilities equal to the new design for current anti-air warfare threats, it will not perform as well against future threats.¹⁸⁴

Endo-Atmospheric Target for Simulating DF-21D ASBM

A December 2011 report from DOD's Director, Operational Test and Evaluation (DOT&E)—the DOT&E office's annual report for FY2011—states the following in its section on test and evaluation resources:

Anti-Ship Ballistic Missile Target

A threat representative Anti-Ship Ballistic Missile (ASBM) target for operational open-air testing has become an immediate test resource need. China is fielding the DF-21D ASBM, which threatens U.S. and allied surface warships in the Western Pacific. While the Missile Defense Agency has exo-atmospheric targets in development, no program currently exists for an endo-atmospheric target. The endo-atmospheric ASBM target is the Navy's responsibility, but it is not currently budgeted. The Missile Defense Agency estimates the non-recurring expense to develop the exo-atmospheric target was \$30 million with each target costing an additional \$30 million; the endo-atmospheric target will be more expensive to produce according to missile defense analysts. Numerous Navy acquisition programs will require an ASBM surrogate in the coming years, although a limited number of targets (3-5) may be sufficient to validate analytical models.¹⁸⁵

A February 28, 2012, press report stated:

¹⁸⁴ Government Accountability Office, *Defense Acquisitions[:] Assessments of Selected Weapon Programs*, GAO-13-294SP, March 2013, p. 46.

¹⁸⁵ Department of Defense, Director, Operational Test and Evaluation, *FY 2011 Annual Report*, December 2011, p. 294.

“Numerous programs will require” a test missile to stand in for the Chinese DF-21D, “including self-defense systems used on our carriers and larger amphibious ships to counter anti-ship ballistic missiles,” [Michael Gilmore, the Pentagon’s director of operational test and evaluation] said in an e-mailed statement....

“No Navy target program exists that adequately represents an anti-ship ballistic missile’s trajectory,” Gilmore said in the e-mail. The Navy “has not budgeted for any study, development, acquisition or production” of a DF-21D target, he said.

Lieutenant Alana Garas, a Navy spokeswoman, said in an e-mail that the service “acknowledges this is a valid concern and is assessing options to address it. We are unable to provide additional details.”...

Gilmore, the testing chief, said his office first warned the Navy and Pentagon officials in 2008 about the lack of an adequate target. The warnings continued through this year, when the testing office for the first time singled out the DF-21D in its annual public report....

The Navy “can test some, but not necessarily all, potential means of negating anti-ship ballistic missiles,” without a test target, Gilmore said.¹⁸⁶

The December 2012 report from DOT&E (i.e., DOT&E’s annual report for FY2012) did not further discuss this issue; a January 21, 2013, press report stated that this is because the details of the issue are classified.¹⁸⁷

Press Reports

A March 16, 2012, blog entry states:

China has developed a missile that would turn an aircraft carrier into a 2-billion-dollar hulk of twisted metal, flame, and dead sailors. Publicly, the U.S. Navy downplays its importance. Privately, the sailors are working out several different options to kill it before it kills them.

Adm. Jonathan Greenert, the Navy’s top officer, explained to reporters during a Friday [March 16] breakfast meeting that the Navy has ways of exploiting some of the DF-21D missile’s formidable technical capabilities, even before opening fire and praying.

As Greenert sees it, there’s a menu of options. Some involve convincing the DF-21D that the carrier is in a different place. Others involve masking the electronic emissions of the carrier. Still others are more traditional—like blasting the missile out of the salty air.

“You want to spoof them, preclude detection, jam them, shoot them down if possible, get them to termination, confuse it,” Greenert said. “The concept is end-to-end, and the capabilities therein [are] what we’re pursuing”

First up: the missile’s guidance systems. This is where Greenert wants the Navy’s investment in jamming and electronic warfare generally to pay off.

¹⁸⁶ Tony Capaccio, “Navy Lacks Targets To Test U.S. Defenses Against China Missile,” *Bloomberg Government* (*bgov.com*), February 28, 2012. See also Christopher J. Castelli, “DOD IG Questions Realism Of Targets Used To Simulate Enemy Missiles,” *Inside Missile Defense*, March 21, 2012.

¹⁸⁷ Christopher J. Castelli, “DOD Testing Chief Drops Public Discussion Of ASBM Target Shortfall,” *Inside the Navy*, January 21, 2013.

“If whatever is launched has a seeker, can you jam it?” Greenert mused. “Yes, no, maybe so? What would it take to jam it?” For now, that’s a job for the flying, jamming Growlers which messed with Moammar Gadhafi’s anti-aircraft systems in Libya last year. Later on, the Navy will have a next-generation jammer, also built onto some of its jets, which it wants to use to infect enemy systems with malware. Alternatively or in supplement, the strike group would go radio silent, to stop the missile from homing in on its electronic emissions.

Then comes the “more popular” part, Greenert said: shooting the missile down. The Aegis missile-defense cruisers included in an aircraft carrier strike group would be tasked with that over the next decade. Afterward, the Navy wants to use giant shipboard lasers to burn through incoming missiles. But it’s by no means clear the Navy really can clear all the technological obstacles to oceanic laser warfare by its mid-2020s deadline.

And shooting down this new missile isn’t a guaranteed proposition. “When do you have to engage it? On the way up? Mid-course? Terminal?” Greenert said.

His answer: all of the above. “We call it links of a chain,” Greenert said. “We want to break as many links as possible.” Navy weapons have to be ready to disable the DF-21D—either through jamming it or shooting it—during “all” phases of its trajectory.

There’s also something that Greenert didn’t mention: he has time on his side.

The Navy conceded in December 2010 that the DF-21D had reached “initial operating capability.” But its intelligence chief quickly added that blowing up a carrier is still past China’s means. Hitting a moving object is difficult. Testing the thing at sea is too. Then China needs to integrate the missile into its general surface warfare plans. And after all that come the countermeasures Greenert outlined. Solving all that takes time.

And while China works on that, the Navy will continue its own development. If Greenert is freaked out by a weapon that can punch through one of the most potent symbols of American power, he’s doing a good job of hiding it in public.¹⁸⁸

In a December 2011 journal article, Major General Timothy Hanifen, the Director of Expeditionary Warfare (N85) in the office of the Chief of Naval Operations, stated:

Logistically, in order to sustain the Fleet’s capability to fight near-continuously across vast distances, a game-changing technology-development effort is needed in the area of rapid at-sea vertical-launch system (VLS)¹⁸⁹ replenishment and reloading. Current pier-side VLS reload requirements force a disruption of Fleet combat tempo and increase the probability of warship engagement in port, when it is most vulnerable. With rapid at-sea replenishment and an adequate combat reload inventory, the fleet could continue to leverage the vastness of the seas to complicate targeting and lower effective engagement probabilities, while simultaneously maintaining a very high and sustained combat tempo during both force closure and across the joint campaign. Without that ability, battle-force operations increase in risk as they become more tied to naval-base replenishment and thereby more predictable, sequential, and vulnerable....

¹⁸⁸ Spencer Ackerman, “How To Kill China’s ‘Carrier-Killer’ Missile: Jam, Spoof And Shoot,” *Danger Room* (*Wired.com*), March 16, 2012, accessed online at <http://www.wired.com/dangerroom/2012/03/killing-chinas-carrier-killer/>. The word “[are],” in brackets, as in original.

¹⁸⁹ A ship’s battery of vertical tubes for storing and launching missiles is referred to as a VLS. At present, VLS tubes cannot be rapidly reloaded at sea.

At present, the Navy is developing very capable and elegant anti-ballistic intercept missiles that allow its ships to defensively engage with precision at long ranges. The Fleet also has less-elegant, close-in missile- and weapons-capabilities. What is potentially missing is an intermediate-range naval gun capability that increases engagement opportunities and adds both density and depth to layered defenses. Within the Navy, there are a total of 106 MK 45 5-inch 54/62-caliber guns that can be linked via warship sensors for shared battle-network awareness and cooperative-engagement capability—one that is currently unused.

The existing guns, if outfitted with common, modular, long-range 5-inch rounds, could provide both an individual warship and the overall Fleet with a greater engagement range and weapons-effects density through the massing of fires. That massing of fire could be accomplished against over-the-horizon high and low targets at long ranges, then gradually shifted in successive engagement opportunities to direct line-of-sight fires within the radar envelope. It could effectively create a wall of shrapnel pellets and fragments into which inbound aircraft and missiles would fly and be destroyed—not unlike the old 3-inch/50 variable time and radio-frequency fuse weapons effects of World War II. A 5-inch pellet/flechette round would have equally blinding and devastating effects on adversary surface and land-based radars and electronic systems, swarming small boats, command-and-control ships, and sites ashore—with a value-added naval surface fire support application against ground forces.

Developing a near-term, long-range naval gunfire engagement capability for air, missile, and surface defense is feasible, achievable, and affordable. Recently, the Zumwalt-class destroyers' advance gun system 6-inch/155-mm long-range land attack projectile round was successfully and accurately fired to a distance of about 62 nautical miles. Advances in its technical maturity and adaptability have made it possible to develop and produce a smaller, common 5-inch long-range variant. For the equivalent research-and-development cost of procuring fewer SM3/SM6 missiles, the Fleet could potentially design, develop, and field a modular 5-inch long-range round to be used in both the MK 45 and EMRG gun mounts when the latter enter service in the mid-2020s. The common 5-inch round is conceptually, technologically, fiscally, and developmentally feasible and achievable. It should be pursued and fielded at flank speed.¹⁹⁰

A November 9, 2011, press report stated that Vice Admiral Scott Swift, the commander of the U.S. Navy's 7th Fleet (the fleet responsible for the Western Pacific),

downplayed concerns about China's development of a ballistic missile, dubbed the DF-21D, that could theoretically be capable of sinking American aircraft carriers at great distance. If true, it's the kind of game changer that some fear could, during a crisis, force the U.S. away from strategic areas such as the Taiwan Strait, the waters around Korea, and the South China Sea.

"The capability is significant. Whether any given system will live up to its design is arguable," Adm. Swift said. He said it's unwise to figure any single weapon could be a "holy grail" for a particular fighting force and emphasized the totality of a fighting force's options.

"You have to look at those systems holistically and what the overall impact is. I will tell you based on what I see, I don't envision changing any of my operation based on one specific system," Adm. Swift said.¹⁹¹

¹⁹⁰ Timothy C. Hanifen, "At the Point of Inflection," *U.S. Naval Institute Proceedings*, December 2011: 26 and 31.

¹⁹¹ Alex Frangos, "U.S. Navy Commander Calls for Greater Dialogue," *Wall Street Journal* (<http://blogs.wsj.com/chinarealtime>), November 9, 2011.

An August 29/September 5, 2011, press report states:

Each possible [Chinese] source of ISR [intelligence, surveillance and reconnaissance targeting data] for the DF-21 looks vulnerable in its own way, helping to explain why the U.S. Navy says it can break the kill chain for the missile. Yet it seems that in many links [in the kill chain], information [on the location of U.S. Navy ships] could be collected redundantly, so breaking one [link] does not mean breaking the chain....

In all cases, the data needs to flow back to China from the [ISR] sensor, and the system's control center presumably needs to send commands to the sensor platform—more links in the kill chain that would have to be protected [by the Chinese]. If the DF-21D needs targeting updates as it flies, then that data feed would also be at risk.

If the missile is designed for an air burst—to spread destruction across a carrier's deck rather than lunging into the hangar, machinery and command spaces—then its fuse could also be a target of countermeasures.¹⁹²

The then-Chief of Naval Operations, Admiral Gary Roughead, stated the following in an interview published on April 4, 2011:

Question: China reportedly has deployed a so-called aircraft carrier killer. Does such a weapon upset the balance of power insofar as the Navy is concerned?

Roughead: No. You have to look at the total employment of the weapon. You have to look at the nature of being able to first locate, then target, and then engage a moving sea-borne target at range. I'm always struck at how captivated people have gotten about the carrier killer. Nobody's talking about the precision with which every fixed airfield in the region could be targeted. I really do think that it is not the game-changer people have played it up to be.¹⁹³

A March 16, 2011, press report states:

"There has been a lot of discussion about the Dong Feng 21 missile," [Admiral Gary] Roughead acknowledged. "But the DF 21 is no more an anti-access weapon than a submarine is. I would argue that you can put a ship out of action faster by putting a hole in the bottom [with a torpedo] than by putting a hole in the top [with a weapon like the DF-21]."

Noting the superiority of the Navy's Virginia-class attack submarines over the several types China is building, Roughead declared that "even though the DF 21 has become a newsworthy weapon, the fact is our aircraft carriers can maneuver, and we have systems that can counter weapons like that."

"My objective," in regards to the Chinese, Roughead said, "is to not be denied ocean areas where can operate, or not be restricted in our ability to operate."¹⁹⁴

A February 15, 2011, press report states:

¹⁹² Bradley Perrett, "Pacific Projections," *Aviation Week & Space Technology*, August 29/September 5, 2011: 67-68.

¹⁹³ "'We're Not Gambling,'" *Aviation Week & Space Technology*, April 4, 2011: 66.

¹⁹⁴ Christopher P. Cavas, "Roughead Says Russian, Chinese Navies Growing," *NavyTimes.com*, March 16, 2011.

A new “carrier killer” missile that has become a symbol of China’s rising military might will not force the U.S. Navy to change the way it operates in the Pacific, a senior Navy commander told The Associated Press.

Defense analysts say the Dong Feng 21D missile could upend the balance of power in Asia, where U.S. aircraft carrier battle groups have ruled the waves since the end of World War II.

However, Vice Adm. Scott van Buskirk, commander of the U.S. 7th Fleet, told the AP in an interview that the Navy does not see the much-feared weapon as creating any insurmountable vulnerability for the U.S. carriers - the Navy’s crown jewels.

“It’s not the Achilles heel of our aircraft carriers or our Navy - it is one weapons system, one technology that is out there,” Van Buskirk said in an interview this week on the bridge of the USS George Washington, the only carrier that is home-based in the western Pacific....

Van Buskirk, whose fleet is responsible for most of the Pacific and Indian oceans, with 60-70 ships and 40,000 sailors and Marines under its command, said the capabilities of the Chinese missile are as yet unproven. But he acknowledged it does raise special concerns.

“Any new capability is something that we try to monitor,” he said.

“If there wasn’t this to point to as a game changer, there would be something else,” he said. “That term has been bandied about for many things. I think it really depends in how you define the game, whether it really changes it or not. It’s a very specific scenario for a very specific capability - some things can be very impactful.”...

Still, van Buskirk said the Navy has no intention of altering its mission because of the new threat and will continue to operate in the seas around Japan, Korea, the Philippines and anywhere else it deems necessary.

“We won’t change these operations because of this specific technology that might be out there,” he told The AP while the USS George Washington was in its home port just south of Tokyo for repairs last week. “But we will carefully monitor and adapt to it.”¹⁹⁵

Admiral Roughead stated the following in a January 14, 2011, interview:

Question: As you say, you don’t jump with the revelation of another capability, particularly as you might have known it was coming. But excitable headline writers like to talk about the ASBM as a game-changer. Is that accurate?

Roughead: I think it is a bit of an overstatement. I find it very interesting when you talk about the ballistic missile capability and the fixation on the ASBM, the fact of the matter is that with regard to the other military capabilities that are land-based, you could have the co-ordinates of every 20 feet of airstrip preprogrammed and you know it is not going to move. I would submit the beauty of naval forces is their flexibility, and the challenges of finding, targeting and then hitting them. It is a new capability and a new application of a ballistic missile, but at the same time, I look at it and say let’s move forward with this.

Question: Do you have any idea about timetables for deployment? Admiral Willard has talked about this.

¹⁹⁵ Eric Talmadge, “3-Star: Anti-Carrier Missile Won’t Stop Navy,” *NavyTimes.com*, February 15, 2011.

Roughead: He talked about the initial operational capability, which is a term we use. It would not surprise me that in the next couple of years that that capability will be in play.

Question: But have you been preparing for some time your own structure to incorporate that?

Roughead: I think across the board I am always looking at developments and at how do we keep our options open relative to those developments. For me personally, the PLAN has been an area of interest since I was first exposed to it in a very personal way starting in 1994. Through a series of assignments I have been able to watch it. I have had a focused professional interest in it. So I watch and do the things that I have to do to make sure that my navy is ready.¹⁹⁶

Vice Admiral David J. Dorsett, the Deputy Chief of Naval Operations for Information Dominance, stated the following at a January 5, 2011, meeting with defense reporters:

Question: What are the resourcing requirements implications of the Chinese missile given you said it's got capability [inaudible]? Are there major improvements in the Aegis air defense system that you're recommending or [inaudible] the edges? What are the defensive implications for the Navy and resources in the next four or five years?

Dorsett: First of all, Tony, going into any level of detail would be a classified answer, and I'll tell you, like any advanced technology that's developed for military use around the globe, the U.S. Navy needs to develop counters. We need to be innovative in that approach. I think that's one of the things that with creation of information dominance, we've been able to look at a variety of kinetic and non-kinetic solution sets to counter advancing capabilities. And relative to advanced missile systems, we're doing that as well. It's a vague answer for you, but it's the best I can do.

Question: Can you give a sense of whether the Aegis system is roughly capable of handling this threat?

Dorsett: Because of the – I'd prefer not to answer the question.¹⁹⁷

Navy's Ability to Counter China's Submarines

Another potential oversight issue for Congress concerns the Navy's ability to counter China's submarines. Some observers raised questions about the Navy's ability to counter Chinese submarines following an incident on October 26, 2006, when a Chinese Song-class submarine reportedly surfaced five miles away from the Japan-homeported U.S. Navy aircraft carrier *Kitty Hawk* (CV-63), which reportedly was operating at the time with its strike group in international waters in the East China Sea, near Okinawa. According to press reports, the carrier strike group at the time was not actively searching for submarines, and the Song-class boat remained undetected by the strike group until it surfaced and was observed by one of the strike group's aircraft.¹⁹⁸ The Chinese government denied that the submarine was following the strike group.¹⁹⁹

¹⁹⁶ Source: Transcript of interview, as appended to Richard McGregor, "US Fleet Chief Voices Doubts On Chinese Navy," *Financial Times*, January 18, 2011.

¹⁹⁷ Source: Transcript of Defense Writers Group roundtable with Vice Admiral David J. Dorsett, Deputy CNO for Information Warfare. Material in brackets as in the transcript.

¹⁹⁸ Bill Gertz, "China Sub Secretly Stalked U.S. Fleet," *Washington Times*, November 13, 2006: 13; Philip Creed, (continued...)

Improving the Navy's ability to counter China's submarines could involve procuring platforms (i.e., ships and aircraft) with ASW capabilities, and/or developing technologies for achieving a new approach to ASW that is distributed and sensor-intensive (as opposed to platform-intensive). Navy officials in 2004-2005 spoke of their plans for achieving distributed, sensor-intensive ASW architecture.²⁰⁰ Such an approach might involve the use of networked sensor fields, unmanned vehicles, and standoff weapons. Implementing such an approach to ASW reportedly would require overcoming some technical challenges, particularly for linking together large numbers of distributed sensors, some of which might be sonobuoys as small as soda cans.²⁰¹

Countering wake-homing torpedoes more effectively could require completing development work on the Navy's new anti-torpedo torpedo (ATT) and putting the weapon into procurement.²⁰² A July 21, 2011, press report states that DOD

is seeking congressional permission to immediately boost funding for a high-priority Navy effort to give aircraft carriers and other high-value ships the ability to defend against torpedo attacks, something they lack today. Pentagon comptroller Robert Hale, in a May 8 reprogramming request not made public by the Defense Department, told lawmakers DOD wants to shift \$8 million into Navy research-and-development accounts to support rapid prototyping of the Anti-Torpedo Torpedo Defense System (ATTDS).²⁰³

(...continued)

"Navy Confirms Chinese Sub Spotted Near Carrier," *NavyTimes.com*, November 13, 2006; Bill Gertz, "Defenses On [sic] Subs To Be Reviewed," *Washington Times*, November 14, 2006; En-Lai Yeoh, "Fallon Confirms Chinese Stalked Carrier," *NavyTimes.com*, November 14, 2006; Bill Gertz, "Admiral Says Sub Risked A Shootout," *Washington Times*, November 15, 2006; Jeff Schogol, "Admiral Disputes Report That Kitty Hawk, Chinese Sub Could Have Clashed," *Mideast Starts and Stripes*, November 17, 2006.

¹⁹⁹ Associated Press, "China Denies Reports That Sub Followed Kitty Hawk," *NavyTimes.com*, November 16, 2006. A shorter version of the same story was published as Associated Press, "China Denies Sub Followed A Group Of U.S. Warships," *Asian Wall Street Journal*, November 17, 2006: 11.

²⁰⁰ See, for example, Otto Kreisher, "As Underwater Threat Re-Emerges, Navy Renews Emphasis On ASW," *Seapower*, October 2004, p. 15, and Jason Ma, "ASW Concept Of Operations Sees 'Sensor-Rich' Way Of Fighting Subs," *Inside the Navy*, February 7, 2005.

²⁰¹ Jason Ma, "Autonomous ASW Sensor Field Seen As High-Risk Technical Hurdle," *Inside the Navy*, June 6, 2005. See also Jason Ma, "Navy's Surface Warfare Chief Cites Progress In ASW Development," *Inside the Navy*, January 17, 2005. More recent press reports discuss research on ASW concepts involving bottom-based sensors, sensor networks, and unmanned vehicles; see Richard Scott, "GLINT In the Eye: NURC Explores Novel Autonomous Concepts For Future ASW," *Jane's International Defence Review*, January 2010: 34-35; Richard Scott, "DARPA Goes Deep With ASW Sensor Network," *Jane's International Defence Review*, March 2010: 13; Richard Scott, "Ghost In The Machine: DARPA Sets Course Towards Future Unmanned ASW Trail Ship," *Jane's Navy International*, April 2010: 10-11; Norman Friedman, "The Robots Arrive," *Naval Forces*, No. IV, 2010: 40-42, 44, 46; Bill Sweetman, "Darpa Funds Unmanned Boat For Submarine Stalking," *Aerospace Daily & Defense Report*, January 6, 2011: 5; Richard Scott, "Networked Concepts Look to Square the ASW Circle," *Jane's International Defence Review*, January 2011: 42-47; Richard Scott, "DARPA's Unmanned ASW Sloop Concept Casts Lines," *Jane's Navy International*, January/February 2011: 5.

²⁰² For articles discussing torpedo defense systems, including ATTs, see Richard Scott, "Ships Shore Up," *Jane's Defence Weekly*, September 1, 2010: 22-23, 25, 27; Mike McCarthy, "NAVSEA Seeks Industry Thoughts On Torpedo Defense Systems," *Defense Daily*, November 29, 2011: 4-5.

²⁰³ Jason Sherman, "Navy Seeks Funding To Develop First Anti-Torpedo Capability For Carriers," *Inside the Navy*, July 18, 2011.

Navy's Fleet Architecture

Another potential oversight issue for Congress concerns the Navy's fleet architecture. Some observers, viewing the anti-access aspects of China's naval modernization effort, including ASBMs, ASCMs, and other anti-ship weapons, have raised the question of whether the U.S. Navy should respond by shifting over time to a more highly distributed fleet architecture featuring a reduced reliance on carriers and other large ships and an increased reliance on smaller ships. Supporters of this option argue that such an architecture could generate comparable aggregate fleet capability at lower cost and be more effective at confounding Chinese maritime anti-access capabilities. Skeptics, including supporters of the currently planned fleet architecture, question both of these arguments.²⁰⁴

Another question bearing on fleet architecture concerns the future role of Navy unmanned vehicles in countering Chinese anti-access forces. A July 16, 2012, press report states:

The Navy is eyeing potential investments in revolutionary unmanned systems with greater autonomy than today's drones to counter advanced Chinese weapons capable of threatening U.S. warships, according to draft guidance for a new assessment.

²⁰⁴ The question of whether the U.S. Navy concentrates too much of its combat capability in a relatively small number of high-value units, and whether it should shift over time to a more highly distributed fleet architecture, has been debated at various times over the years, in various contexts. Much of the discussion concerns whether the Navy should start procuring smaller aircraft carriers as complements or replacements for its current large aircraft carriers.

Supporters of shifting to a more highly distributed fleet architecture argue that the Navy's current architecture, including its force of 11 large aircraft carriers, in effect puts too many of the Navy's combat-capability eggs into a relatively small number of baskets on which an adversary can concentrate its surveillance and targeting systems and its anti-ship weapons. They argue that although a large Navy aircraft carrier can absorb hits from multiple conventional weapons without sinking, a smaller number of enemy weapons might cause damage sufficient to stop the carrier's aviation operations, thus eliminating the ship's primary combat capability and providing the attacker with what is known as a "mission kill." A more highly distributed fleet architecture, they argue, would make it more difficult for China to target the Navy and reduce the possibility of the Navy experiencing a significant reduction in combat capability due to the loss in battle of a relatively small number of high-value units.

Opponents of shifting to a more highly distributed fleet architecture argue that large carriers and other large ships are not only more capable, but proportionately more capable, than smaller ships, that larger ships are capable of fielding highly capable systems for defending themselves, and that they are much better able than smaller ships to withstand the effects of enemy weapons, due to their larger size, extensive armoring and interior compartmentalization, and extensive damage-control systems. A more highly distributed fleet architecture, they argue, would be less capable or more expensive than today's fleet architecture. Opponents of shifting to a more highly distributed fleet architecture argue could also argue that the Navy has already taken an important (but not excessive) step toward fielding a more distributed fleet architecture through its plan to acquire 55 Littoral Combat Ships (LCSs), which are small, fast surface combatants with modular, "plug-and-flight" mission payloads. (For more on the LCS program, see CRS Report RL33741, *Navy Littoral Combat Ship (LCS) Program: Background and Issues for Congress*, by Ronald O'Rourke

The issue of Navy fleet architecture, including the question of whether the Navy should shift over time to a more highly distributed fleet architecture, was examined in a report by DOD's Office of Force Transformation (OFT) that was submitted to Congress in 2005. OFT's report, along with two other reports on Navy fleet architecture that were submitted to Congress in 2005, are discussed at length in CRS Report RL33955, *Navy Force Structure: Alternative Force Structure Studies of 2005—Background for Congress*, by Ronald O'Rourke. The functions carried out by OFT have since been redistributed to other DOD offices. See also Wayne P. Hughes, Jr., *The New Navy Fighting Machine: A Study of the Connections Between Contemporary Policy, Strategy, Sea Power, Naval Operations, and the Composition of the United States Fleet*, Monterey (CA), Naval Postgraduate School, August 2009, 68 pp.; Timothy C. Hanifen, "At the Point of Inflection," *U.S. Naval Institute Proceedings*, December 2011: 24-31; and the blog entry available online at <http://www.informationdissemination.net/2011/06/navy-is-losing-narratives-battle.html>.

Although Defense Department and naval leaders have previously called for drones with greater levels of autonomy, the “specific pathways” for the introduction of enabling technologies have not yet been identified, states the draft terms of reference for the Naval Research Advisory Committee’s planned review.²⁰⁵

Legislative Activity for FY2014

FY2014 National Defense Authorization Act (H.R. 1960/S. 1197)

House (Committee Report)

Section 1257 of H.R. 1960 as reported by the House Armed Services Committee (H.Rept. 113-102 of June 7, 2013) states:

SEC. 1257. SENSE OF CONGRESS ON MILITARY CAPABILITIES OF THE PEOPLE’S REPUBLIC OF CHINA.

Congress—

(1) notes the People’s Republic of China (PRC) continues to rapidly modernize and expand its military capabilities across the land, sea, air, space, and cyberspace domains;

(2) is concerned by the rate and scope of PRC military developments, including its military-focused cyber espionage, which indicate a desire to constrain or prevent the peaceful activities of the United States and its allies in the Western Pacific;

(3) concurs with Admiral Samuel Locklear, commander of U.S. Pacific Command, that ‘China’s rapid development of advanced military capabilities, combined with its unclear intentions, certainly raises strategic and security concerns for the U.S and the region’;

(4) notes the United States remains committed to a robust forward military-presence in the Asia-Pacific and will continue to vigorously support mutual defense arrangements with treaty allies while also building deeper relationships with other strategic partners in the region; and

(5) urges the Government of the PRC to work peacefully to resolve existing territorial disputes and to adopt a maritime code of conduct with relevant parties to guide all forms of maritime interaction and communications in the Asia-Pacific.

H.Rept. 113-102 states:

The committee is concerned about the Navy’s overall fleet size and the continuous sustained demand for naval forces, especially in light of the Administration’s strategic shift to operations in the Asia-Pacific. Therefore, the restriction precluding the Navy from retiring seven Ticonderoga-class guided missile cruisers and two amphibious ships well before the end of their expected service life continues for fiscal year 2014. The committee would provide additional funds to the Navy to properly modernize and maintain these critical naval

²⁰⁵ Christopher J. Castelli, “Investments In Drone Autonomy Eyed To Counter China’s A2/AD Weapons,” *Inside the Navy*, July 16, 2012.

assets. The committee notes that it is less costly to maintain existing assets than to procure new ones and this funding ensures the correct naval capabilities and fleet mix for the length of time originally authorized by Congress. (Page 6)

H.Rept. 113-102 also states:

Offensive anti-surface warfare weapon development

The budget request contained \$136.0 million in PE 64786N²⁰⁶ for offensive anti-surface warfare weapon development.

In 2009, the U.S. Pacific Fleet validated an Urgent Operational Needs Statement for an over-the-horizon surface warfare missile that can be launched from aircraft or surface vessels and strike well-defended, moving maritime targets without reliance on external inputs. This need is even more relevant today and is critical to meeting national security objectives and rebalance to the Asia-Pacific region. The committee supports the Secretary of the Navy's pursuit for the rapid development and deployment of a long-range, anti-ship missile that is capable of penetrating sophisticated enemy air-defense systems from long range. It should be capable of operating autonomously in a denied signal environment, without relying on input of intelligence, surveillance, and reconnaissance or global positioning system signals.

However, the committee notes recent inconsistencies with the Department of Defense's acquisition strategy for this type of air-launched/surface-launched missile capability. Furthermore, the current effort does not appear to be consistent with the budget documentation materials provided with the submission of the President's fiscal year 2014 budget to Congress, and the committee understands that the Department of Defense has revised the acquisition strategy since the President's budget submission.

The committee recommends \$136.0 million, the full amount requested, in PE 64786N for offensive anti-surface warfare weapon development, and calls into question the Secretary's ability to execute \$86.0 million of those funds in fiscal year 2014 for product-development activities prior to achieving a milestone A for the program.

The committee directs the Secretary of the Navy, the Director of Cost Assessment and Program Evaluation, and the Undersecretary of Defense for Acquisition, Technology and Logistics to submit to the defense committees by September 30, 2013, the most recent OASuW Analysis of Alternatives completed by the Department of Defense.

The committee also directs the Secretary of the Navy to provide to the defense committees by September 30, 2013, a report that: (1) outlines the Secretary's near-, mid-, and long-term capability and acquisition roadmaps for maintaining air-launched and surface-launched offensive anti-surface warfare weapon capabilities within the Department of Defense; (2) describes capability gaps and shortfalls of the Navy regarding current and future OASuW capabilities; (3) any supporting analysis that have informed the Secretary's roadmap; (4) any on-going technology experimentation, engineering, product development, or modification efforts within the Department of Defense that would enhance the Secretary's ability to develop and field future OASuW capabilities, and an assessment of the maturity and associated risks of those technologies and efforts; and, (5) updated budget estimates and life-cycle funding estimates of the Department of Defense required to develop, engineer,

²⁰⁶ Line items in DOD research and development accounts are referred to as Program Elements, or PEs. PE 64786N is a line item in the Navy's research and development account (as indicated by the "N" at the end) for offensive anti-surface warfare weapon development.

manufacture, test, field and sustain new or modified air-launched and surface-launched OASuW missile capabilities in the planned roadmaps. The report may contain a classified annex. (Pages 58-59)

H.Rept. 113-102 also states:

Air Sea Battle Office

The committee is aware that the military services established the Air Sea Battle (ASB) office in 2012 as a result of the U.S. Joint Forces Command (USJFCOM) disestablishment. USJFCOM had an office focused on the Air Sea Battle concept integration, specifically as it related to requirements, capability gaps and shortfalls, projects and programs directly related to effectively employing in an anti-access/area-denial (A2/AD) contingency operation. The committee is concerned whether the placement of the current ASB office outside of the Joint Staff is the most logical and effective location for integrating ASB concepts across the services. The committee believes the Secretary of Defense should evaluate the ASB office to see if it is accomplishing its goals to enable and prepare the U.S. military to effectively operate in an A2/AD environment, and whether the office provides a unique function and perspective or it duplicates other efforts carried out elsewhere in the Department of Defense. Therefore, the committee directs the Secretary of Defense to determine the effectiveness of the ASB office and whether the office is carrying out a unique function or duplicates other efforts. Should the Secretary conclude that the ASB office is effective and non-duplicative of other efforts, the Secretary should determine whether the ASB office should continue as is, be modified, or placed within the Joint Staff. The committee directs the Secretary to brief the House Committee on Armed Services by January 31, 2014, on the results of the analysis and the future of the ASB office. (Page 193)

House (Floor Consideration)

On June 13, 2013, as part of its consideration of H.R. 1960, the House agreed to by voice vote an en bloc amendment that included, among other things, an amendment listed as Number 96 in H.Rept. 113-108 of June 13 (legislative day June 12), 2013, which provided for the further consideration of H.R. 1960. Amendment Number 96 became **Section 903** of H.R. 1960 as passed by the House on June 14, 2013. Section 903 states:

SEC. 903. REPORT ON STRATEGIC IMPORTANCE OF UNITED STATES MILITARY
INSTALLATION OF THE U.S. PACIFIC COMMAND.

(a) Report Required- Not later than 180 days after the date of the enactment of this Act, the Secretary of Defense, in consultation with the Secretary of Homeland Security, shall submit to the congressional defense committees a report on the strategic value of each major installation that supports operations in the United States Pacific Command.

(b) Content of Report- The report required by subsection (a) shall include, at a minimum, an assessment of the following with respect to each major installation covered by the report:

(1) The strategic value of the operations of the installation in the Pacific Command Area of Responsibility, including the strategic value of the installation for the global deployment of airpower, military personnel, and logistical support.

(2) The usefulness of the installation for potential future missions, including military, search and rescue, and humanitarian missions in a changing Pacific and Arctic region.

- (3) The suitability of the installation for basing of F-35 aircraft and other future weapons systems in the Pacific Command Area of Responsibility.
- (4) The suitability of the installation for mission growth, including relocation of combat-coded aircraft, Army units, naval vessels, and Marine Corps units from overseas bases.
- (5) How critical the installation is in maintaining and expanding the North and Southern Pacific air refueling bridge.
- (6) The availability of the installation for basing remotely piloted aircraft.
- (7) The proximity of the installation to scoreable, instrumented training ranges, with an emphasis on joint-training.
- (8) The impact of urban encroachment on the installation and its training ranges.
- (c) Classified Annex- The report required by subsection (a) may include a classified annex if necessary to fully describe the matters required by subsection (b).

Senate

Section 1232 of S. 1197 as reported by the Senate Armed Services Committee (S.Rept. 113-44 of June 20, 2013) states:

SEC. 1232. ELEMENT ON 5TH GENERATION FIGHTER PROGRAM IN ANNUAL REPORT ON MILITARY AND SECURITY DEVELOPMENTS INVOLVING THE PEOPLE'S REPUBLIC OF CHINA.

Section 1202(b) of the National Defense Authorization Act for Fiscal Year 2000 (10 U.S.C. 113 note) is amended by adding at the end the following new paragraph:

“(20) The status of the 5th generation fighter program of the People’s Republic of China, including an assessment of each individual aircraft type, estimated initial and full operational capability dates, and the ability of such aircraft to provide air superiority.”.

Regarding Section 1232, S.Rept. 113-44 states:

Element on 5th generation fighter program in annual report on military and security developments involving the People’s Republic of China (sec. 1232)

The committee recommends a provision that would add a requirement for the Department of Defense to include information on China’s 5th generation fighter programs in the congressionally mandated Annual Report on Military and Security Developments involving the People’s Republic of China. Although recent versions of the report include information about China’s 5th generation fighters, this provision make this aspect of China’s military development a permanent part of the annual report. (Page 200)

S.Rept. 113-44 also states:

U.S. military posture and resiliency in the Asia-Pacific

The committee remains interested in the posture of U.S. forces in the Asia-Pacific region and the implications of the strategic rebalance announced as part of the Defense Strategic

Guidance in January 2012. While this rebalance toward the Asia-Pacific encompasses more than just U.S. military presence and posture, the current and future U.S. military force posture in the Asia-Pacific region is a critical element of the overall geo-political security strategy in Asia.

The committee understands that U.S. Pacific Command is currently conducting a study of resiliency and developing an associated resiliency plan as one element of the force posture and supporting infrastructure. The committee is reluctant to support new investments in infrastructure until it has reviewed the study and the plan and better understands both the linkage between resiliency and strategy and the long term affordability and sustainability of the plan.

Accordingly, the committee urges the Secretary of Defense to provide the results of the U.S. Pacific Command's study of resiliency, with an explanation of how the resiliency plan supports the overall theater strategic plan, to the Committees on Armed Services of the Senate and the House of Representatives. (Page 243)

FY2014 DOD Appropriations Act (S. 1429)

Senate

The Senate Appropriations Committee, in its report (S.Rept. 113-85 of August 1, 2013) on S. 1429, states

With the fiscal year 2014 budget submission, the Navy again proposes to prematurely retire seven Ticonderoga-class guided missile cruisers and two amphibious dock landing ships that have a combined remaining service life of over 100 years. The Committee notes that this proposal was rejected by the Congress in the Fiscal Year 2013 National Defense Authorization Act and the Fiscal Year 2013 Department of Defense Appropriations Act; and that Congress provided significant funds to man, operate, sustain and modernize these ships. As previously expressed in Senate Report 112-196, the Committee is concerned with this proposed elimination of force structure and believes it is disconnected from the strategic shift to the Asia-Pacific, creates future unaffordable shipbuilding requirements, and exacerbates force structure shortfalls that negatively impact the Department's ability to meet Combatant Command requirements. (Page 10)

The report also states:

The F/A-18E/F Super Hornet continues to be the Navy's premier carrier asset for force projection, and it will remain the backbone of the Navy's tactical aircraft fleet for the next 25 years. The fiscal year 2014 budget indicates the end of domestic production with the final procurement of EA-18G Growlers. The Committee is concerned with the decision to end Super Hornet production and believes a strong carrier-based fleet is vital to the increased emphasis on the Pacific region. Due to the delay in fielding the Navy variant of the Joint Strike Fighter, ending the Super Hornet production prematurely creates risk in the Navy's strike fighter force structure, and in the Nation's production capacity and a competitive industrial base. Therefore, the Committee recommends a \$75,000,000 increase for advance procurement of F/A-18 aircraft and expects the Navy to procure additional aircraft in the fiscal year 2015 budget request. (Page 93)

The report also states:

The Committee notes that the fiscal year 2014 budget request submitted by the Navy, once again, failed to present a plan to address the amphibious lift shortfall that exists today. In January 2009, the Navy and Marine Corps determined a minimum force of 33 ships is the limit of acceptable risk in meeting a 38-ship amphibious warship force requirement. As of now, there are 28 ships in the Navy's amphibious fleet, with an average of only 22 ships operationally available at any given time due to maintenance and overhaul schedules. This level of assumed risk with amphibious lift capability by the Department of the Navy deeply concerns the Committee. Of particular concern is the impact it has on the ability of Commanders to meet operations plans and crisis response requirements, particularly as instability in the Middle East continues and as the Department of Defense rebalances its global posture towards the Asia-Pacific region. (Page 101)

Appendix A. Background Information on Air-Sea Battle Concept

This appendix provides additional background information on the Air-Sea Battle Concept.

DOD Unclassified Summary Released June 2013

On June 3, 2013, DOD released an unclassified summary of the Air-Sea Battle Concept.²⁰⁷ The following pages reprint the document.

²⁰⁷ Air-Sea Battle Office, *Air-Sea Battle[:] Service Collaboration to Address Anti-Access & Area Denial Challenges*, May 2013, 12 pp., accessed July 5, 2013, at <http://www.defense.gov/pubs/ASB-ConceptImplementation-Summary-May-2013.pdf>, and at <http://navylive.dodlive.mil/files/2013/06/ASB-26-June-2013.pdf>. The latter of these two URLs provided a version with a smaller file size. For a DOD announcement of the document's release, see Jason Kelly, "Overview of the Air-Sea Battle Concept," Navy Live, June 3, 2013, accessed July 5, 2013, at <http://navylive.dodlive.mil/2013/06/03/overview-of-the-air-sea-battle-concept/>.

DOD officials had discussed the ASB concept in earlier statements; for example:

Admiral Jonathan Greenert, the Chief of Naval Operations, and General Mark Welsh, the Chief of Staff of the Air Force, discussed the ASB concept in a May 16, 2013, blog post; see Jonathan Greenert and Mark Welsh, "Breaking the Kill Chain[:] How to Keep America in the Game When Our Enemies Are Trying to Shut Us Out," *Foreign Policy*, May 16, 2013, accessed July 5, 2013, at http://www.foreignpolicy.com/articles/2013/05/16/breaking_the_kill_chain_air_sea_battle.

- General Norton Schwartz, then-Chief of Staff of the Air Force, and Admiral Jonathan Greenert, the Chief of Naval Operations, discussed the ASB concept in a February 20, 2012, journal article; see Norton A. Schwartz and Jonathan W. Greenert, "Air-Sea Battle, Promoting Stability In An Era of Uncertainty," *The American Interest*, February 20, 2012, accessed July 5, 2013, at <http://www.the-american-interest.com/article.cfm?piece=1212>.
- The Air-Sea Battle Office released a statement on the ASB concept on November 9, 2011; see "The Air-Sea Battle Concept Summary," accessed July 5, 2013, at http://www.navy.mil/search/display.asp?story_id=63730.



FOREWORD: The Air-Sea Battle Concept

From its inception, the U.S. military has continuously adapted itself to meet evolving threats. At its core, the Air–Sea Battle (ASB) Concept is about reducing risk and maintaining U.S. freedom of action and reflects the Services’ most recent efforts to improve U.S. capabilities. Similar to previous efforts, the Concept seeks to better integrate the Services in new and creative ways. It is a natural and deliberate evolution of U.S. power projection and a key support component of U.S. national security strategy for the 21st century.

Air Land Battle was developed in the 1970s and 1980s to counter a Soviet backed combined arms attack in Europe. A key component of AirLand Battle was the degradation of rear echelon forces before they could engage allied forces. This mission was largely assigned to the Air Force and led to unprecedented coordination between the Army and Air Force. The ASB Concept is similarly designed to attack-in-depth, but instead of focusing on the land domain from the air, the Concept describes integrated operations across all five domains (air, land, sea, space, and cyberspace) to create advantage. The ASB Concept further differentiates itself from its predecessor in that the ASB Concept also strives to protect our rear echelon across the same domains. This defensive aspect of ASB helps the Joint Force reduce risk in the face of increasingly longer range and more precise weapons which could affect our space-based platforms, land forces, airbases, capital ships, and network infrastructure.

While ASB is not a strategy, it is an important component of DoD’s strategic mission to project power and sustain operations in the global commons during peacetime or crisis. Implementation of the ASB Concept, coordinated through the ASB office, is designed to develop the force over the long-term, and will continue to inform institutional, conceptual, and programmatic changes for the Services for years to come. The ASB Concept seeks to provide decision makers with a wide range of options to counter aggression from hostile actors. At the low end of the conflict spectrum, the Concept enables decision makers to engage with partners to assure access, maintain freedom of action, conduct a show of force, or conduct limited strikes. At the high end of the conflict spectrum, the Concept preserves the ability to defeat aggression and maintain escalation advantage despite the challenges posed by advanced weapons systems.

The ASB Concept is a limited but critical component in a spectrum of initiatives aimed at shaping the security environment. Similar to other concepts, ASB makes important contributions in both peace and war. The improved combat capabilities advocated by the concept may help shape the decision calculus of potential aggressors. Additionally, continued U.S. investments in the capabilities identified in the concept reassure our allies and partners, and demonstrate the U.S. will not retreat from, or submit to, potential aggressors who would otherwise try and deny the international community the right to international waters and airspace. When combined with security assistance programs and other whole-of-government efforts, the ASB Concept reflects the U.S. commitment to maintaining escalation advantage during conflict and sustaining security and prosperity in the global commons.

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1 | INTRODUCTION

The Department of Defense recognizes the need to explore and adopt options that will preserve U.S. ability to project power and maintain freedom of action in the global commons. In July 2009, the Secretary of Defense directed the Departments of the Navy and the Air Force to address this challenge and to embark on a new operational concept called Air-Sea Battle (ASB). Since then, the U.S. Army, Marine Corps, Navy, and Air Force have collaborated in new and innovative ways to address the anti-access/area denial (A2/AD) military problem set. Then in January 2012, the President of the United States and the Secretary of Defense introduced new strategic guidance in *Sustaining U.S. Global Leadership: Priorities for 21st Century Defense* that specifically tasked the U.S. military to project power despite A2/AD. In Fall 2012, all four of the Services' Vice Chiefs signed a memorandum of understanding establishing a framework to implement the ASB Concept through the development of a joint force capable of shaping and exploiting A2/AD environments in order to maintain freedom of action in the global commons, and secure operational access to enable concurrent or follow-on joint operations.

What follows is a fuller description of the military problem presented to U.S. and allied forces by A2/AD threats; how ASB addresses this problem; ASB's role in service and joint force development; and how ASB is being implemented. This reference is designed to provide an overview of the ASB Concept and what the Services are doing to operationalize or implement its tenets within their force development processes. At an unclassified level, this summary reference cannot wholly describe the concept or these actions. The original ASB Concept, its annexes, and the Fiscal Year 13 Implementation Master Plan (IMP) remain classified as they lay out the specific details of how the joint force should be developed to defeat A2/AD threats and how the Services are implementing those recommendations. These restricted documents are recommended reading for individuals with the requisite clearances and need to know. However, what is presented here is directly adapted from the ASB Concept and the FY13 IMP and carefully presents the core ideas and activities of ASB and its implementation.

2 | ANTI-ACCESS/AREA DENIAL (A2/AD)

A2/AD capabilities are those which challenge and threaten the ability of U.S. and allied forces to both get to the fight and to fight effectively once there. Notably, an adversary can often use the same capability for both A2 and AD purposes. It is the effect of A2/AD on U.S. and expeditionary operations that matters.

A2/AD capabilities and strategies to employ them combine to make U.S. power projection increasingly risky, and in some cases prohibitive, while enabling near-peer competitors and regional powers to extend their coercive strength well beyond their borders. In the most challenging scenarios, the U.S. may be unable to employ forces the way it has in the past: build up combat power in an area, perform detailed rehearsals and integration activities, and then conduct operations when and where desired. By acquiring these advanced A2/AD technologies, potential adversaries are changing the conditions of warfare that the U.S. has become accustomed to in the past half century.

ANTI-ACCESS (A2)	AREA-DENIAL (AD)
Action intended to slow deployment of friendly forces into a theater or cause forces to operate from distances farther from the locus of conflict than they would otherwise prefer. A2 affects <i>movement</i> to a theater.	Action intended to impede friendly operations within areas where an adversary cannot or will not prevent access. AD affects <i>maneuver within</i> a theater.

While A2/AD ideas are not new—the desire to deny an adversary both access and the ability to maneuver are timeless precepts of warfare—technological advances and proliferation threaten stability by empowering potentially aggressive actors with previously unattainable military capabilities. A new generation of cruise, ballistic, air-to-air, and surface-to-air missiles with improved range, accuracy, and lethality is being produced and proliferated. Modern submarines and fighter aircraft are entering the militaries of many nations, while sea mines are being equipped with mobility, discrimination and autonomy. Both space and cyberspace are becoming increasingly important and contested. The pervasiveness and advancement of computer technology and reliance on the internet and usable networks are creating means and opportunity for computer attack by numerous state and non-state aggressors, and the domain of space is now integral to such military capabilities as communications, surveillance, and positioning. In certain scenarios, even low-technology capabilities, such as rudimentary sea mines, fast-attack small craft, or shorter range artillery and missile systems render transit into and through the commons vulnerable to interdiction by coercive, aggressive actors, slowing or stopping free movement. The range and scale of possible effects from these capabilities presents a military problem that threatens the U.S. and allied expeditionary warfare model of power projection and maneuver.

The A2/AD threat exceeds any single or specific theater of operations, and creates problematic consequences for international security. For example, an aggressor can slow deployment of U.S. and allied forces to a theater, prevent

coalition operations from desired theater locations, or force friendly forces to operate from disadvantageous longer distances. Effectively undermining integrated U.S. and allied operations, the aggressor is likely to drive allies and partners to seek accommodation with potential aggressors, or to develop alternate means of self-defense with potentially destabilizing effects. Such an environment induces instability, erodes the credibility of U.S. deterrence, can necessitate escalation in U.S. and allied responses, and weakens U.S. international alliances including associated trade, economic, and diplomatic agreements.

PROBLEM STATEMENT

Adversary capabilities to deny access and areas to U.S. forces are becoming increasingly advanced and adaptive. These A2/AD capabilities challenge U.S. freedom of action by causing U.S. forces to operate with higher levels of risk and at greater distance from areas of interest. U.S. forces must maintain freedom of action by shaping the A2/AD environment to enable concurrent or follow-on operations.

A concept to address this operational problem must be based on realistic assumptions regarding how an adversary will employ A2/AD capabilities. The assumptions that underpin the ASB Concept reflect a conservative view of what an adversary could do, and have direct implications for how the U.S. can and should respond.

First, the *adversary will initiate military activities with little or no indications or warning*. While the adversary may signal or threaten in an attempt to deter U.S. or allied actions to maintain access, the adversary gains no advantage by telegraphing the commencement of hostilities – and does not need to. Capabilities such as ballistic and cruise missiles will be used with little warning, and ambiguous or minimal warning will be received of air and maritime deployments. The implications are that a short warning timeline requires the U.S. to maintain ready forces that are routinely integrated and prepared to conduct high risk operations against very capable adversaries.

Second, given the lack of indications or warning, *forward friendly forces will be in the A2/AD environment at the commencement of hostilities*. As a result, the steady state posture and capabilities of forces must be able to provide an immediate and effective response to adversary A2/AD attacks through high tempo operations in the A2/AD environment. Additional forces introduced into the threat environment should be able to promptly integrate into the existing force posture.

Third, *adversaries will attack U.S. and allied territory supporting operations against adversary forces*. In addition to attacking American aircraft, ships, space assets, networks, and people, denying access to U.S. forces requires attacks on bases from which U.S. and its allies are operating, including those on allied or partner territory. The implication is that the defense of all bases from which U.S. forces operate must be addressed, whether on U.S. or partner/allied territory. Even the U.S. homeland cannot be considered a sanctuary, and real-time prioritization may be required between homeland defense and overseas operations.

Fourth, *all domains will be contested by an adversary*—space, cyberspace, air, maritime, and land. Cyberspace and space-based capabilities are essential for U.S. operations and are vulnerable to adversary capabilities with a

low barrier to entry such as computer network attack and electronic jamming. Since the adversary may employ a multi-domain approach, ASB must defend and respond in each warfighting domain.

Lastly, *no domain can be completely ceded to the adversary*. Each domain can be used to impact and deny access to the others, so to cede one domain to an adversary invites the eventual loss of the other interdependent domains. While U.S. forces may contest freedom of action in each domain, they are not likely to be required to achieve control in each domain simultaneously or to the same degree. As such, U.S. forces must take advantage of freedom of action in one domain to create U.S. advantage or challenge an adversary in another. This will require tightly coordinated actions across domains using integrated forces able to operate in each domain.

3 | THE AIR-SEA BATTLE CONCEPT

ASB is a limited objective concept that describes what is necessary for the joint force to sufficiently shape A2/AD environments to enable concurrent or follow-on power projection operations. The ASB Concept seeks to ensure freedom of action in the global commons and is intended to assure allies and deter potential adversaries. ASB is a supporting concept to the Joint Operational Access Concept (JOAC), and provides a detailed view of specific technological and operational aspects of the overall A2/AD challenge in the global commons. The Concept is not an operational plan or strategy for a specific region or adversary. Instead, it is an analysis of the threat and a set of classified concepts of operations (CONOPS) describing how to counter and shape A2/AD environments, both symmetrically and asymmetrically, and develop an integrated force with the necessary characteristics and capabilities to succeed in those environments. ASB is about building conceptual alignment, programmatic collaboration and institutional commitment in an integrated way, across the military Services in order to develop forces and capabilities that can jointly address A2/AD challenges. The purpose of ASB is not to simply conduct operations more jointly. It is to increase operational advantage across all domains, enhance Service capabilities and mitigate vulnerabilities. In addition to other joint and service concepts, ASB will help ensure the U.S. ability to gain and maintain freedom of action in the global commons, and conduct concurrent or follow-on operations against a sophisticated adversary.

Central Idea. The ASB Concept's solution to the A2/AD challenge in the global commons is to develop networked, integrated forces capable of attack-in-depth to disrupt, destroy and defeat adversary forces (NIA/D3). ASB's vision of networked, integrated, and attack-in-depth (NIA) operations requires the application of cross-domain operations across all the interdependent warfighting domains (air, maritime, land, space, and cyberspace), to disrupt, destroy, and defeat (D3) A2/AD capabilities and provide maximum operational advantage to friendly joint and coalition forces.

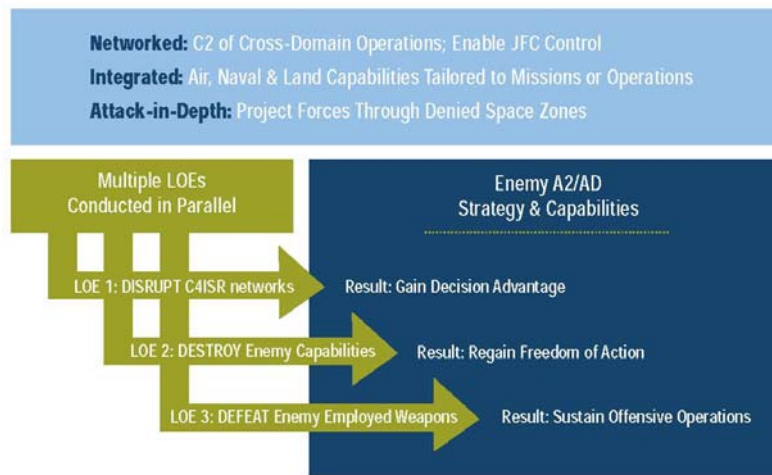


Figure 1. Components of ASB's Conceptual Design 'NIA/D3'

Cross-domain operations are conducted by integrating capabilities from multiple interdependent warfighting domains to support, shape, or achieve objectives in other domains. Cross-domain operations are those that can exploit asymmetric advantages in specific domains to create positive and potentially cascading effects in other domains. For cross-domain operations to be fully effective, commanders, whether defending or attacking, must have ready access to capabilities, no matter what domain they reside in or which commander owns them, to support or achieve operational objectives and create the effects required for advantage over an adversary. This interoperability may require multi-pathing, or the ability to use multiple, alternative paths from among all domain capabilities to achieve a desired end. While cross-domain operations are more complex than single domain or single Service options, their multi-pathing possibilities can provide distinct operational advantages over single domain or single Service solutions to operational problems.

The ability to integrate capabilities, equipment, platforms, and units across multiple domains and to communicate, interact, and operate together presents a joint force commander with more numerous and powerful options, which in turn, offer greater probability of operational success. For example, cyber or undersea operations can be used to defeat air defense systems, air forces can be used to eliminate submarine or mine maritime threats, or space assets can be used to disrupt adversary command and control. Put simply, traditional understandings of Service missions, functional responsibilities, or employment of capabilities from particular domains should not be barriers that hamper imaginative joint operations in an A2/AD environment. Each of the elements of ASB's construct offer joint force commanders increased flexibility and capability.

Networked. In the ASB Concept, networked actions are tightly coordinated in real time by mission-organized forces to conduct integrated operations across all domains without being locked into Service-specific procedures, tactics, or weapons systems. A networked force is people and equipment linked in time and purpose with interoperable

procedures; command control (C2) structures; and appropriate authorities capable of translating information into actions. These joint forces are able to attack the adversary A2/AD system-of-systems in depth and across all domains to create and exploit vulnerabilities.

Networked capabilities are both the physical means by which forces communicate and exchange information and the relationships, protocols, and procedures used by warfighters to complete their assigned missions. To be effective, networked forces need interoperable procedures, (C2) structures, and equipment. Authorities must also be provided at the appropriate C2 level in order for joint and coalition forces to gain and maintain decision advantage. In the ASB



Air-Sea Battle mitigates access challenges by moving beyond simply de-conflicting operations in each war fighting domain, toward creating the level of domain integration necessary to defeat increasingly varied and sophisticated threats.

*Secretary of Defense Leon Panetta
20 February 2012*

Concept, networked does not only mean having assured communications and access to data; it also means having a force trained to conduct operations using mission-type orders and being able to operate even in the absence of continuous connectivity. The joint force can achieve that ability in part by establishing habitual relationships across Service, component, and domain lines so that forces can be effectively trained to operate together in a contested and degraded environment.

Integrated. Integration is the arrangement of military forces and their actions to create a force that operates networked across domains as a whole. An integrated joint force is better able to combine capabilities across multiple domains to conduct specific missions. The basic concept of integration has further evolved into seeking the development of pre-integrated joint forces. In order to maintain an advantage over potential adversaries, air, naval, and land forces must fully integrate their operations. Integration, traditionally viewed as strictly the combatant commander's job, needs to begin across Service lines as part of force development.

Forces should be integrated prior to entering a theater. Effective integration requires enhanced joint and combined training against A2/AD capabilities, including training and exercise for cross-domain operations before deployment. In some cases, pre-integration will also require Services' collaboration in materiel programming to ensure interoperability to avoid overly redundant or incompatible systems.

Attack-in-depth to Disrupt, Destroy and Defeat. The attack-in-depth methodology is based on adversary effects chains, or an adversary's process of finding, fixing, tracking, targeting, engaging and assessing an attack on U.S. forces. Attack-in-depth is offensive and defensive fires, maneuver, and command and control with the objective of disrupting, destroying, or defeating an adversary's A2/AD capabilities, conducted across domains in time, space, purpose, and resources. Attack-in-depth seeks to apply both kinetic and non-kinetic means to address

adversary critical vulnerabilities without requiring systematic destruction of the enemy's defenses (e.g., a rollback of an adversary's integrated air defense system).

D3 represents the 3 lines of effort of the ASB Concept:

- **Disrupt** Adversary Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR or C4I);
- **Destroy** adversary A2/AD platforms and weapons systems; and,
- **Defeat** adversary employed weapons and formations.

Disrupting these effects chains includes impacting an adversary's C4ISR or C4I capabilities, ideally precluding attack on friendly forces. **Destroying** or neutralizing adversary weapons platforms enhances friendly survivability and provides freedom of action. **Defeating** employed weapons post-launch defends friendly forces from an adversary's attacks and allows sustained operations.

Due to the nature of A2/AD threats and potentially short indications and warning timelines posed by adversaries, joint forces must be capable of effective offensive operations as soon as conflict begins, while simultaneously defending or re-positioning deployed forces, protecting land and sea bases, and bringing forces forward from garrison with acceptable levels of risk. The ability to attack and defend through the entire depth of the desired battlespace, in all the interdependent warfighting domains, is critical to establishing joint freedom of action.

4 | ROLE IN JOINT FORCE DEVELOPMENT

The ASB Concept is focused on joint force development. As a service concept, it falls under the Services' Title 10 responsibilities to man, train, and equip forces for employment by the combatant commands. Accordingly, the objective of the ASB Concept is to inform force development to ultimately provide combatant commanders' joint forces with the aforementioned NIA-D3 capabilities that will help ensure freedom of access in the global commons. The ASB Concept is intended to foster future capabilities that directly support several of the U.S. Armed Forces primary missions described in the DoD's Strategic Guidance (DSG): *Sustaining U.S. Global Leadership: Priorities for 21st Century Defense*. These include missions to Deter and Defeat Aggression, Project Power Despite Anti-Access/Area Denial Challenges, and to Operate Effectively in Cyberspace and Space.

PRIMARY MISSIONS OF THE U.S. ARMED FORCES

- Counter Terrorism & Irregular Warfare
- **Deter & Defeat Aggression**
- **Project Power Despite Anti-Access/Area Denial Challenges**
- Counter Weapons of Mass Destruction
- **Operate Effectively in Cyberspace and Space**
- Maintain a Safe, Secure, & Effective Nuclear Deterrent
- Defend Homeland & Provide Support to Civil Authorities
- **Provide A Stabilizing Presence**
- Conduct Stability & Counterinsurgency Operations
- Conduct Humanitarian, Disaster Relief & Other Operations

The ASB Concept is also a supporting concept to and thus complements the overarching Chairman of the Joint Chiefs of Staff's force development vision detailed in the *Capstone Concept for Joint Operations: Joint Force 2020 (CCJO)*, JOAC, and the emerging Joint Concept for Entry Operations (JCEO). As a capstone document, the CCJO describes the future operating environment and the high-order vision for how the future force will need to conduct *Globally Integrated Operations* across the Range of Military Operations (ROMO). ASB is aligned with this operating environment and several of the key elements required to achieve the Chairman's vision – specifically concerning the need for developing cross-domain synergy in the future force.

JOAC is a component under the CCJO that broadly describes how U.S. joint forces will overcome opposed access challenges. It establishes guiding precepts and capabilities necessary to assure access and for the joint forces to overcome A2/AD threats. At the next level, ASB supports JOAC by identifying more specific means and requirements by which the joint force may defeat those adversary threats in order to maintain freedom of action in the global commons.

JCEO, at the same level as ASB, will focus on guiding force development to enable joint force entry operations in an A2/AD environment. ASB can be seen to support JCEO by covering that freedom of action and access requirements in the global commons that ultimately support the joint force's ability to conduct concurrent or follow-on entry operations.

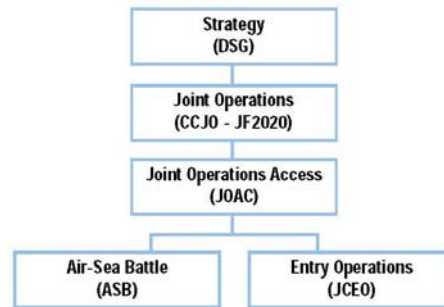


Figure 2. Relationship between Strategy, CCJO, JOAC, JCEO & ASB

Like other joint concepts, ASB does not seek to create a new force, as in one with wholly new equipment or capabilities, but instead endeavors to unify Service Title 10 efforts to develop forces that fight together more effectively. The Concept is a natural evolution of joint coalition warfighting toward more networked and integrated operational employment. It is an example of how the separate Services can formally collaborate, yet still protect, develop, and maintain unique Service capabilities, equities, and culture.

The ASB Concept views the joint force in a holistic way to include doctrine, organization, training, materiel, leadership, personnel, and facilities (DOTMLPF) within the Services' purview to organize, train, and equip. The ASB Concept specifically addresses a range of threats, such as ballistic and cruise missiles, sophisticated integrated

air defense systems, anti-ship capabilities from high-tech missiles and submarines to low-tech swarming boats, electronic warfare, and counter-C4ISR capabilities. Yet, the ASB Concept differs from other concepts because, while it contains the operational details needed in a limited objective concept, it is about fostering institutional change, conceptual alignment, and materiel change in and among the Services.

- Institutional Service and joint cooperation is enhanced through enduring organizational collaboration relevant to A2/AD environments as they evolve over time. Over the long term, the Concept envisions closer collaboration and integration of the Services' organize, train, and equip activities across the DOTMLPF spectrum. This will be done by expanding integration efforts through collaborative planning and increased liaison to emphasize more joint training at the operational and tactical levels.
- Conceptual alignment, perpetuated through the ASB conceptual design, which describes how capabilities and forces are integrated to accomplish combatant commander-directed operational objectives in A2/AD environments. Conceptual alignment actions fall into three broad categories: concept development, wargaming, and experimentation.
- Materiel solutions and innovations are collaboratively developed and vetted to ensure they are complementary where appropriate, redundant when mandated by capacity requirements, fully interoperable, and fielded with integrated acquisition strategies. ASB advocates for a process with expected products with a specific timeline to better facilitate Services' programmatic collaboration. The process is not intended to supplant existing Service activities, but to benefit from those activities and act as a focal point for improving inter-Service collaboration.

These key objectives guide the Services' efforts to develop the networked, integrated forces able to attack and defend where and when required—throughout any contested domain. Through these objectives, the Concept strives to develop a pre-integrated joint force ready to meet the A2/AD challenges. Such a pre-integrated joint force is built from the aforementioned habitual relationships, interoperable and complementary cross-domain capabilities. It benefits from realistic, shared training, enhancing the flexibility to develop new tactics, techniques, and procedures (TTPs) on the fly as operational conditions dictate. Such forces will provide the strategic deterrence assurance and stabilizing effects of a force in being and be ready at the outset of a contingency to avoid delays for buildups or extensive mission rehearsal.

5 | IMPLEMENTATION

SPECIFIC EXAMPLES OF ACTIONS BEING TAKEN BY THE SERVICES TO IMPLEMENT AIR-SEA BATTLE:

- Incorporating contested & denied environments into Service training & education
- Incorporating characteristics of contested environments into Service and Joint exercises
- Continuing subordinate concept development in support of CCJO, JOAC, and Air-Sea Battle
- Conducting engagement activities to ensure conceptual alignment with partners, build necessary partner capacity, and to strengthen relationships to assure access
- Conducting various studies and experiments to determine the validity of specific counter-A2/AD capabilities and concepts
- Conducting war games to explore future structures and policies for cross-domain operations command and control (XDO C2) and experiments to integrate and enable XDO C2 at the tactical level in A2/AD environments
- Developing multi-service tactics, techniques & procedures (TTPs) that address the A2/AD environment
- Conducting Service wargames focused on the Air-Sea Battle Concept's application in realistic operational scenarios
- Collaborating on Service resource planning and programming
- Incorporating Air-Sea Battle's and counter-A2/AD ideas into Joint and Service doctrine
- Establish & strengthen habitual relationships among Service organizations with complementary or similar operational purposes

In late 2011, the Secretary of Defense endorsed the ASB Concept as a necessary first step to address the anti-access, area denial challenge and directed the Services to work further to develop the Concept. To this end, the Services established a multi-service, flag-level ASB Executive Committee (EXCOM), Senior Steering Group (SSG), and supporting staff charged with implementing the Concept. Composed of representatives from each of the four Services, the role of the ASB Office is to foster the development and adoption of the related conceptual, institutional and material solutions through coherent implementation of the Concept's NIA/D3 construct. The ASB Office advocates for ASB initiatives, monitors their progress, and coordinates with various stakeholders within each Service.

The ASB office has established subject matter expert working groups and held implementation workshops to further validate, refine, and expand the original ASB Concept work as well as to lay out a plan for multi-Service implementation. This plan describes the recommended processes and actions to develop forces and enhance military capabilities necessary to counter current and future A2/AD challenges, using 2020 as the objective year. Accordingly, ASB is expected to be a multi-year process, as advanced capabilities come on line and the Services strengthen and enhance their habitual relationships and closely integrate their organize, train, and equip actions.

Following are examples of the actions being taken by the Services to implement the ASB Concept.

Incorporating contested & denied environments into Service training & education. In order to produce forces that can operate in, and counter an A2/AD environment, the Services must train to an increasingly challenging A2/AD environment and more fully integrate tactics, techniques, and procedures across service, functional, and domain lines. The Services will incorporate contested, degraded operations into their training and education programs, from the individual and unit level through integrated training in the deployed environment. Required training focus will

include both active measures, such as integrating capabilities to neutralize advanced adversary air defenses, and passive measures, such as comprehensive emissions control training. Education will include teaching the ASB Concept and JOAC precepts and ideas in Service professional military education courses and war colleges.

Incorporating characteristics of contested environments into Service and Joint exercises. The nature of heavily defended A2/AD capabilities makes attacking them, either kinetically or non-kinetically, far more challenging. Cross-domain solutions are required in order for manned or unmanned weapons systems to be able to penetrate and survive in contested environments. Cross-domain and multi-service training will be the focus in both defensive and offensive operations.

Continuing subordinate concept development in support of CCJO, JOAC, and ASB. CCJO, JOAC, and ASB have attempted to outline the current and future threat, however the nature of warfare dictates the threat will evolve in unpredictable ways. Continued development of the ASB Concept's ideas, in more detail, will be needed as the threat and operational scenarios change. Subordinate or complementary concepts will be developed, both to support the operationalization of the ASB Concept and to support the JOAC and the CCJO.

Conducting engagement activities to build conceptual alignment and partner capacity and to strengthen relationships to assure access. Shaping and engagement activities during implementation ensures conceptual alignment with our partners and allies, builds necessary partner capacity and strengthens our relationships which facilitate and assure access to multiple domains in the event conflict occurs.

Conducting various studies and experiments to determine the validity of specific counter-A2/AD capabilities and concepts. Studies and experimentation are critical for the evolution of concepts in to doctrine. Continued study and assessment of ASB's operational solutions will be conducted, as will experimentation into innovative capabilities and processes to defeat A2/AD threats and enhance joint integration and interdependence.

Conducting experiments with integrated command and control of cross-domain operations. Command and control is the heart and soul of joint operations; fighting in a multi-domain environment against a capable adversary will require innovative methods to ensure decision advantage and operational success. The Services will review and better integrate the existing C2 structures to allow for ease of cross-domain operations.



...future Joint Forces will leverage better integration to improve cross-domain synergy—the complementary vice merely additive employment of capabilities across domains in time and space. While the U.S. military maintains unique advantages in every domain, it is our ability to project force across domains that so often generates our decisive advantage.

Capstone Concept for Joint Operations

Developing multi-service TTPs that address the A2/AD environment. Current Joint and Service TTPs still largely reflect an operational environment where U.S. and coalition operational access is unchallenged. During the multi-year implementation process of ASB and JOAC, Service-level and combatant commander-level organizations must review, revise, and (in some cases) develop the necessary TTPs based on the results of wargaming, experimentation, tactics development, and exercises/cross-domain training events. Joint TTPs are already developed collaboratively by the Services; ASB will seek closer, earlier, and more ubiquitous collaboration on how best to operate, share information, and train the force to proficiency.

Conducting Service wargames focused on the ASB Concept's application in realistic operational scenarios. Service Title 10 wargames are key shaping events for force development. All four Services will address various aspects of the evolving A2/AD environment. They will be informed by and build on each other's work. This will include collaborative support of sister Service wargames with subject matter experts.

Collaborating on Service resource planning and programming. The joint force ultimately ends up with the capabilities it invests in; ASB will seek closer integration of resource planning and programming. This will begin with mutually developed capability gaps and integrated solution sets; these are followed by collaborated, integrated priorities provided to Service resource sponsors and programmers.

Incorporating ASB and counter-A2/AD ideas into Joint and Service doctrine. Once best practices and TTPs are validated, the Services will reflect these in their doctrine. This includes reviewing existing doctrine and, where applicable, advocating the use of suitable doctrine for emerging and future environments.

Establishing & strengthening habitual relationships among Service organizations with complementary or similar operational purposes. The ASB Concept will largely be implemented by the Fleet and Field; encouraging and facilitating the establishment of habitual relationships between operational level and tactical level units is critical to the long-term success of the ASB Concept's ideas. This includes Echelon 2 and 3 organizations such as the USAF's Air Combat Command (ACC), the Navy's Fleet Forces Command (FFC), the Army's Training and Doctrine Command (TRADOC), and the Marine Corps' Combat Development Command (MCCDC).

6 | CONCLUSION

Successful implementation of the ASB Concept will require unprecedented levels of joint and combined integration founded on comprehensive and habitual relationships that span from the fleets and forces in the field to the headquarters' staffs in the Pentagon. Substantial aspects of joint force development, operations, training, acquisition, and modernization will be involved in order to meet the challenge and be ready. Given the proliferation of advanced A2/AD technologies, NIA/D3 solutions will be a necessary component for the U.S. military's ability to continue to confidently operate forward and project power throughout the world. The ASB Concept is a natural evolution of the joint force and relations with allies toward more networked and integrated operational solutions. In a changing world that demands continued U.S. leadership, concepts such as ASB are essential to sustaining America's military freedom of action and ability to project power.



The reality of force development is that about 80% of Joint Force 2020 is programmed or exists today. We do however; have an opportunity to be innovative in two ways. We can significantly change the other 20% of the force, and we can change the way we use the entire force. While new capabilities will be essential, many of our most important advancements will come through innovations in training, education, personnel management, and leadership development.

Capstone Concept for Joint Operations

Press Reports

An August 20, 2012, press report stated that the ASB concept has prompted Navy officials to make significant shifts in the service's FY2014-FY2018 budget plan, including new investments in ASW, electronic attack and electronic warfare, cyber warfare, the F-35 Joint Strike Fighter (JSF), the P-8A maritime patrol aircraft, and the Broad Area Maritime Surveillance (BAMS) UAV (a maritime version of the Global Hawk UAV). The report quoted Chief of Naval Operations Jonathan Greenert as saying that the total value of the budget shifts was certainly in the hundreds of millions of dollars, and perhaps in the "low billions" of dollars.²⁰⁸

An August 2, 2012, press report on the ASB concept states:

When President Obama called on the U.S. military to shift its focus to Asia earlier this year, Andrew Marshall, a 91-year-old futurist, had a vision of what to do.

Marshall's small office in the Pentagon has spent the past two decades planning for a war against an angry, aggressive and heavily armed China.

No one had any idea how the war would start. But the American response, laid out in a concept that one of Marshall's longtime proteges dubbed "Air-Sea Battle," was clear.

Stealthy American bombers and submarines would knock out China's long-range surveillance radar and precision missile systems located deep inside the country. The initial "blinding campaign" would be followed by a larger air and naval assault.

The concept, the details of which are classified, has angered the Chinese military and has been pilloried by some Army and Marine Corps officers as excessively expensive. Some Asia analysts worry that conventional strikes aimed at China could spark a nuclear war.

Air-Sea Battle drew little attention when U.S. troops were fighting and dying in large numbers in Iraq and Afghanistan. Now the military's decade of battling insurgencies is ending, defense budgets are being cut, and top military officials, ordered to pivot toward Asia, are looking to Marshall's office for ideas.

In recent months, the Air Force and Navy have come up with more than 200 initiatives they say they need to realize Air-Sea Battle. The list emerged, in part, from war games conducted by Marshall's office and includes new weaponry and proposals to deepen cooperation between the Navy and the Air Force....

Even as it has embraced Air-Sea Battle, the Pentagon has struggled to explain it without inflaming already tense relations with China. The result has been an information vacuum that has sown confusion and controversy.

Senior Chinese military officials warn that the Pentagon's new effort could spark an arms race....

²⁰⁸ Christopher J. Castelli, "CNO: Air-Sea Battle Driving Acceleration Of Key Programs In POM-14," *Inside the Navy*, August 20, 2012. POM-14 is the Program Objective Memorandum (an internal DOD budget-planning document) for the FY2014 DOD budget.

Privately, senior Pentagon officials concede that Air-Sea Battle's goal is to help U.S. forces weather an initial Chinese assault and counterattack to destroy sophisticated radar and missile systems built to keep U.S. ships away from China's coastline.

Their concern is fueled by the steady growth in China's defense spending, which has increased to as much as \$180 billion a year, or about one-third of the Pentagon's budget, and China's increasingly aggressive behavior in the South China Sea.

"We want to put enough uncertainty in the minds of Chinese military planners that they would not want to take us on," said a senior Navy official overseeing the service's modernization efforts. "Air-Sea Battle is all about convincing the Chinese that we will win this competition."

Inside the Pentagon, the Army and Marine Corps have mounted offensives against the concept, which could lead to less spending on ground combat.

An internal assessment, prepared for the Marine Corps commandant and obtained by The Washington Post, warns that "an Air-Sea Battle-focused Navy and Air Force would be preposterously expensive to build in peace time" and would result in "incalculable human and economic destruction" if ever used in a major war with China.

The concept, however, aligns with Obama's broader effort to shift the U.S. military's focus toward Asia and provides a framework for preserving some of the Pentagon's most sophisticated weapons programs, many of which have strong backing in Congress.²⁰⁹

An April 2012 press report that provides a historical account of the ASB concept states: "In truth, the Air Sea Battle Concept is the culmination of a strategy fight that began nearly two decades ago inside the Pentagon and U.S. government at large over how to deal with a single actor: the People's Republic of China."²¹⁰ A November 10, 2011, press report states:

Military officials from the three services told reporters during a [November 9, 2011, DOD] background briefing that the concept is not directed at a single country. But they did not answer when asked what country other than China has developed advanced anti-access arms.

A senior Obama administration official was more blunt, saying the new concept is a significant milestone signaling a new Cold War-style approach to China.

"Air Sea Battle is to China what the [U.S. Navy's mid-1980s] maritime strategy was to the Soviet Union," the official said.

During the Cold War, U.S. naval forces around the world used a strategy of global presence and shows of force to deter Moscow's advances.

"It is a very forward-deployed, assertive strategy that says we will not sit back and be punished," the senior official said. "We will initiate."

²⁰⁹ Greg Jaffe, "Real Tensions Over A Theoretical War," *Washington Post*, August 2, 2012: 1.

²¹⁰ Bill Gertz, "China's High-Tech Military Threat and What We're Doing About It," *Commentary*, April 2012: 15-21. The quoted passage is from page 16. See also Yoichi Kato, "Japan's Response to New U.S. Defense Strategy: 'Welcome, But ...'" *Asahi Shimbun*, March 9, 2012, accessed online at http://ajw.asahi.com/article/behind_news/politics/AJ201203090025.

The concept, according to defense officials, grew out of concerns that China's new precision-strike weapons threaten freedom of navigation in strategic waterways and other global commons.

Defense officials familiar with the concept said among the ideas under consideration are:

- Building a new long-range bomber.
- Conducting joint submarine and stealth aircraft operations.
- New jointly operated, long-range unmanned strike aircraft with up to 1,000-mile ranges.
- Using Air Force forces to protect naval bases and deployed naval forces.
- Conducting joint Navy, Marine Corps and Air Force strikes inside China.
- Using Air Force aircraft to deploy sea mines.
- Joint Air Force and Navy attacks against Chinese anti-satellite missiles inside China.
- Increasing the mobility of satellites to make attacks more difficult.
- Launching joint Navy and Air Force cyber-attacks on Chinese anti-access forces.²¹¹

An October 12, 2011, press report states that

The Pentagon is engaged in a behind-the-scenes political fight over efforts to soften, or entirely block, a new military-approved program to bolster U.S. forces in Asia.

The program is called the Air Sea Battle concept and was developed in response to more than 100 war games since the 1990s that showed U.S. forces, mainly air and naval power, are not aligned to win a future war with China.

A senior defense official said Defense Secretary Leon E. Panetta is reviewing the new strategy.

"We want to do this right," the official said. "The concept is on track and is being refined to ensure that we are able to implement it wherever we need to—including in the Asia-Pacific region, where American force projection is essential to our alliances and interests."

The official noted that the program is "the product of unprecedented collaboration by the services."

Pro-defense Members of Congress aware of the political fight are ready to investigate. One aide said Congress knows very little about the concept and is awaiting details.

Officially, the Pentagon has said the new strategy is not directed at China.

But officials familiar with the classified details said it is designed to directly address the growing threat to the United States and allies in Asia posed by what the Pentagon calls

²¹¹ Bill Gertz, "Battle Concept Signals Cold War Posture On China," *Washington Times*, November 10, 2011: 13.

China's "anti-access" and "area denial" weapons—high-technology arms that China has been building in secret for the past several decades....

The U.S. response in the Air Sea Battle concept is said to be a comprehensive program to protect the "global commons" used by the United States and allies in Asia from Chinese military encroachment in places such as the South China Sea, western Pacific and areas of Northeast Asia.

The highly classified program, if approved in its current form, will call for new weapons and bases, along with non-military means. Plans for new weapons include a long-range bomber.

Other systems and elements of the program are not known....

However, defense officials said China's government was alerted to some aspects of the concept earlier this year when the Center for Strategic and Budgetary Assessments think tank presented its own concept for a new warfighting strategy against China.

Andrew Krepinevich, the center's director who recently left the Pentagon's Defense Policy Board, could not be reached for comment.

As a result of the disclosure, China launched a major propaganda and influence campaign to derail it. The concept was raised in several meetings between Chinese and U.S. officials, with the Chinese asserting that the concept is a sign the Pentagon does not favor military relations and views China as an enemy.

Officials in the Obama administration who fear upsetting China also are thought to have intervened, and their opposition led Mr. Panetta to hold up final approval.

The final directive in its current form would order the Air Force and the Navy to develop and implement specific programs as part of the concept. It also would include proposals for defense contractors to support the concept.²¹²

An October 2011 magazine article stated:

AirSea Battle emerged from a memorandum between the air and sea services in 2009. The Air Force and Navy realized sophisticated threats involving high technology, networked air defenses, modern ballistic missile, and sea and air capabilities, and anti-space weapons required the services to marry up many of their respective strengths. The plan, which has received a great amount of attention since the 2010 Quadrennial Defense Review, mandated the creation of an operations concept to protect US and allied access to certain areas in the world while also protecting forward-based assets and bases....

Both services are said to be fully on board with the plan, and to weed out duplication, officers from each branch have been cleared to see "all the black programs," or classified projects, of the other service as the ASB plan has matured....

The plan had been vetted by both services by June [2011], and is awaiting blessing from the Office of the Secretary of Defense.... Service officials have been predicting a formal release of more information on the doctrine for months as well.

²¹² Bill Gertz, "Inside the Ring," *Washington Times*, October 12, 2011 (item entitled "Air Sea Battle Fight").

As early as Feb. 17 [2011], Lt. Gen. Herbert J. Carlisle, the Air Force's deputy chief of staff for operations, plans, and requirements, had said a public document explaining the outlines of ASB in detail would occur "possibly within two weeks." The now-retired Chief of Naval Operations Adm. Gary Roughead told reporters in Washington in March he expected to release details on ASB in "a few weeks," as the service Chiefs of the Marines Corps, USAF, and Navy were "basically done" with their work on the concept. The majority of the plan will remain classified, he added, "as it should be."²¹³

A sidebar to this magazine article stated:

The AirSea Battle rollout was repeatedly delayed over the course of 2011. According to Office of the Secretary of Defense and Air Force officials, new Secretary of Defense Leon E. Panetta is reviewing the ASB plan—a sort of executive summary of the overall operations concept (which, as of early September, remains classified).

However, then-Vice Chief of Naval Operations Adm. Jonathan W. Greenert, now the CNO, told the House Armed Services Committee in late July he expected a release of unclassified portions of the plan soon.

The AirSea Battle concept was signed by the USAF, Navy, and Marine Corps service Chiefs, and the Air Force and Navy Secretaries on June 2 and "forwarded to the [Secretary of Defense] for approval," the Air Force said in a brief official statement Aug. 2.

Previous Defense Secretary Robert M. Gates, who departed July 1, had the document in his possession and had told senior Air Force officials he would sign it before his departure. In late July, however, Air Force and DOD officials privately indicated the concept was held up in OSD's policy shop, and Gates did not sign the document before leaving the Pentagon.

Air Force and defense officials have indicated both publicly and privately that there are strong international political considerations at play. Spin "concern" has likely contributed to the delay in officially rolling out the AirSea Battle concept. In late July, USAF officials privately indicated that there is a great deal of concern within OSD about how China will perceive and react to the concept.²¹⁴

A September 29, 2011, press report on a reported new DOD Defense Planning Guidance (DPG) document (see "September 2011 Press Report About New Defense Planning Guidance" above) quoted "a senior defense official" as stating: "It seems clear that there will be increased emphasis on [the] AirSea Battle approach going forward."²¹⁵

A July 26, 2011, press report, stated:

U.S. Defense Secretary Leon Panetta is reviewing an Air Force-Navy battle concept that was ordered by the Pentagon last year in response to China's military buildup and Iran's advanced weapons, Vice Chief of Naval Operations Admiral Jonathan Greenert said today.

The Navy and Air Force have submitted to Panetta the equivalent of an executive summary of the battle concept with the intent to release unclassified portions within weeks, depending

²¹³ Marc V. Schanz, "AirSea Battle's Turbulent Year," *Air Force Magazine*, October 2011: 32-33.

²¹⁴ "An ASB Summer," *Air Force Magazine*, October 2011: 33.

²¹⁵ Christopher J. Castelli, "DOD Aims To Boost Investment In Capabilities For Major-Power War," *Inside the Pentagon*, September 29, 2011.

on Panetta's reaction, Greener told a House Armed Services readiness panel and a Bloomberg News reporter after the hearing.

The plan aims to combine the strengths of the Navy and Air Force to enable long-range strikes. It may employ a new generation of bombers, a new cruise missile and drones launched from aircraft carriers. The Navy also is increasing funding to develop new unmanned submarines.²¹⁶

A June 10, 2011, press report stated that "while defense officials publicly insist that the military's new AirSea Battle concept, a study meant to reshape the way the U.S. military fights future wars, is not focused on China, one Navy team is quietly contradicting their claims. The group, called the China Integration Team, is hard at work applying the lessons of the study to a potential conflict with China, say sources familiar with the effort." The report also stated that "though sources familiar with the study have said that the first draft of the concept has been completed, those same sources highlighted that the project is ongoing—something that official spokesmen have stressed as well."²¹⁷ A January 10, 2011, press report stated that "the AirSea Battle concept study, meant to outline the future of Navy and Air Force operations in anti-access environments, is near completion and is being briefed to Navy Secretary Ray Mabus and Air Force Secretary Michael Donley this month, according to sources familiar with the study."²¹⁸

²¹⁶ Tony Capaccio, "Panetta Reviewing Air-Sea Battle Plan Summary, Greener Says," *Bloomberg News*, July 26, 2011.

²¹⁷ Andrew Burt and Christopher J. Castelli, "Despite Improved Ties, China Weighs Heavily In Pentagon's War Planning," *Inside the Navy*, June 13, 2011.

²¹⁸ Andrew Burt, "Final AirSea Study Being Briefed To Mabus And Donley This Month," *Inside the Navy*, January 10, 2011. See also David Fulghum, "Money Walks? Service Leaders Fight to Explain, Justify AirSea Battle Strategy," *Aviation Week & Space Technology*, June 4/11, 2012: 71; Philip DuPree and Jordan Thomas, "Air-Sea Battle: Clearing the Fog," *Armed Forces Journal*, June 2012.

Appendix B. Article by CNO Greenert on Navy's Rebalancing Toward Asia-Pacific

This appendix presents the text of a November 14, 2012, article by Admiral Jonathan Greenert that provides an overview of Navy activities associated with the U.S. strategic rebalancing toward the Asia-Pacific. The article states:

Our nation's security priorities, and our military, are in transition. In the Middle East, we ended the war in Iraq and are reducing ground troops in Afghanistan with the shift of security responsibilities to Kabul. At home we are reassessing our military's size and composition as we seek to align our spending with our resources. And around the world we face a range of new security challenges, from continued upheaval in the Arab world to the imperative of sustaining our leadership in the Asia-Pacific. These challenges place a premium on the flexibility and small ground footprint of naval forces, which are being deployed longer and more often to advance our nation's interests.

The Department of Defense's January 2012 strategic guidance, Sustaining U.S. Global Leadership - Priorities for 21st Century Defense, addressed this new environment and our security priorities in it. Overall, the strategy focuses on important regions and current readiness and agility, while accepting reduced capacity and level of effort in less critical missions. In particular, the strategy directed that our military rebalance toward the Asia-Pacific while continuing to support our partners in the Middle East. Naval forces will be at the heart of both efforts.

After two decades of ground conflict in the Middle East, our security concerns and ability to project power in the region both center on the sea. U.S. ground forces continue to draw down in Afghanistan and around the region, so our commanders increasingly rely on naval aircraft to support and protect troops. Meanwhile, Iranian leaders speak provocatively about impacting maritime traffic throughout the Arabian Gulf. In response, we turned to maritime forces, doubling our minesweeping forces in the Gulf and deploying an additional carrier strike group to the region.

The focus of our rebalance, the Asia-Pacific, is fundamentally a maritime region. Our friends there depend on the sea for their food and energy, while more than 90 percent of trade by volume makes its way through the region over the water. Maritime security for Pacific nations is a matter of economic survival. Militarily, the vast maritime distances in the region make access via the sea essential to deterring and defeating aggression. Our fleet deployed in the Asia-Pacific will exploit the mobility of being at sea to project power against aggressors and avoid attacks, while their reinforcements and supplies will arrive via the ocean from the United States or regional bases.

The importance of the Asia-Pacific, and the Navy's attention to it, is not new. Five of our seven treaty allies are in the region, as well as six of the world's top 20 economies. We have maintained an active and robust presence in the Asia-Pacific for more than 70 years and built deep and enduring relationships with allies and partners there. While we remain present and engaged in the Middle East to address today's challenges, the Navy will build on its longstanding Asia-Pacific focus by rebalancing in four main ways: deploying more forces to the Asia-Pacific; basing more ships and aircraft in the region; fielding new capabilities focused on Asia-Pacific challenges; and developing partnerships and intellectual capital across the region.

Deploying more forces to the Asia-Pacific

The most visible element of our rebalance toward the Asia-Pacific region will be an increase in day-to-day military presence. Although it is not the only way we are rebalancing, forces operating in the region show our commitment to the Asia-Pacific and provide a full-time capability to support our allies and partners. About half of the deployed fleet is in the Pacific—50 ships on any given day. These ships and their embarked Marines and aircraft train with our allies and partners, reinforce freedom of navigation, and deter conflict. They are also the “first responders” to large-scale crises such as the Great East Asian Earthquake and Tsunami in 2011.

The long distance between the continental United States and Asia makes it inefficient to rotate ships and aircraft overseas for six to nine months at a time. To avoid this transit time and build greater ties with our partners and allies, more than 90 percent of our forces in the Asia-Pacific are there permanently or semi-permanently. For example, about half of our 50 deployed ships are permanently home-ported in Japan and Guam along with their crews and families. Our logistics and support ships use rotating civilian or military crews to obtain more presence for the same number of ships.

Although we plan to reduce our future budgets, the Navy will continue to increase its presence in the Asia-Pacific region. The benchmark year of the Defense Strategic Guidance is 2020, and by then the Navy Fleet will grow to approximately 295 ships. This, combined with the impacts of our plans for operations and basing, will increase the day-to-day naval presence in the Asia-Pacific by about 20 percent, to 60 ships by 2020. In addition to growing the fleet, three factors will allow us to increase the number of ships in the Asia-Pacific by 2020:

First, we will permanently base four destroyers in Rota, Spain over the next several years to help defend our European allies from ballistic missiles. Today we do this mission with 10 destroyers that travel in rotation to the Mediterranean from the United States. The six destroyers freed up in the process will then be able to rotationally deploy to the Asia-Pacific.

Second, new Joint High Speed Vessels (JHSV) and Littoral Combat Ships (LCS) under construction today will enter the fleet and take on security cooperation and humanitarian assistance missions in South America and Africa, allowing the destroyers and amphibious ships we use today for those missions to deploy to the Asia-Pacific. These amphibious ships will begin deploying instead to the Asia-Pacific in the next few years to support Marine operations, including those from Darwin, Australia. Additionally, the new JHSV and LCS are also better suited to the needs of our partners in Africa and South America.

Third, we will field more ships that spend the majority of their time forward by using rotating civilian or military crews. These include the JHSV, LCS, and our new Mobile Landing Platforms and Afloat Forward Staging Bases (AFSB).

In addition to more ship presence in the Asia-Pacific, we will increase our deployments of aircraft there and expand cooperative air surveillance operations with regional partners. Today we fly cooperative missions from Australia, the Philippines, and Thailand, where we build our shared awareness of activities on the sea by either bringing partner personnel on board or sharing the surveillance information with them. We may expand these operations in the future to new partners concerned about threats from piracy, trafficking, and fisheries violations. To expand our surveillance capacity, the Navy version of the MQ-4 Global Hawk unmanned air vehicle will operate from Guam when it enters the fleet in the middle of this decade.

Basing more ships and aircraft in the region

To support our increased presence in the Asia-Pacific, we will grow the fraction of ships and aircraft based on the U.S. West Coast and in the Pacific from today's 55 percent to 60 percent by 2020. This distribution will allow us to continue to meet the needs of Europe, South America, and West Africa while more efficiently providing additional presence and capacity in the Asia-Pacific.

Each ship that operates from an overseas port provides full-time presence and engagement in the region and delivers more options for Combatant Commanders and political leaders. It also frees up ships that would otherwise be needed to support a rotational deployment. Today, we have about two dozen ships home-ported in Guam and Japan. In 2013, with the USS Freedom, we will begin operating Littoral Combat Ships from Singapore, eventually growing to four ships by 2017. The LCS will conduct maritime security operations with partner navies throughout Southeast Asia and instead of rotationally deploying to the region, the ships will stay overseas and their crews will rotate in from the United States, increasing the presence delivered by each ship.

Fielding new capabilities focused on Asia-Pacific challenges

We will also bolster the capabilities we send to the Asia-Pacific. Using the approach described in the Air-Sea Battle concept and in concert with the U.S. Air Force, we will sustain our ability to project power in the face of access challenges such as cruise and ballistic missiles, submarines, and sophisticated anti-air weapons. Air-Sea Battle's operations to disrupt, destroy, and defeat anti-access threats will be essential to maintain the credibility of our security commitments and ability to deter aggression around the world. Our improved capabilities will span the undersea, surface, and air environments.

Undersea

The Navy's dominance in the undersea domain provides the United States a significant advantage over potential adversaries. Our undersea capabilities enable strike and anti-surface warfare in otherwise denied areas and exploit the relative lack of capability of our potential adversaries at anti-submarine warfare. We will sustain our undersea advantage in part through continued improvements in our own anti-submarine warfare capability, such as replacing the 1960s-era P-3 Orion maritime patrol aircraft with the longer range and greatly improved sensors of the P-8A Poseidon.

We will also field improved platforms and systems that exploit the undersea domain for power projection and surveillance. In the coming years, newer, multi-mission Virginia-class submarines with dramatically improved sensors and combat systems will continue to replace aging Los Angeles-class submarines. With their conversion from Cold War-era ballistic missile submarines, our four Ohio-class guided missile submarines (SSGN) are now our most significant power projection platforms. During Operation Unified Protector, USS Florida launched over 100 Tomahawk missiles at Libyan air defenses to help establish a "no-fly" zone. When she and her counterparts retire in the mid 2020s, the Virginia-class submarine "payload module" will replace their striking capacity with the ability to carry up to 40 precision-strike cruise missiles, unmanned vehicles, or a mix of other payloads.

Improved sensors and new unmanned systems allow us to augment the reach and persistence of manned submarines, and are essential to our continued domination of the undersea environment. These unmanned vehicles will enhance the persistence of undersea sensing, and expand its reach into confined and shallow waters that are currently inaccessible to other systems. This will enable detection of threats, for example, to undersea infrastructure.

Surface

But undersea forces have limited effectiveness at visible, day-to-day missions such as security cooperation, humanitarian assistance, missile defense, and freedom of navigation. Surface ships will continue to conduct these operations and show our presence in the Asia-Pacific. Our surface fleet and embarked personnel will continue to be the most versatile element of the naval force, building partner capacity and improving security in peacetime and transitioning to sea control and power projection in conflict. Their credibility and their ability to execute these missions depends on their ability to defeat improving threats, especially anti-ship cruise missiles (ASCM) and anti-ship ballistic missiles (ASBM).

We will defeat ASCMs at long range using an integrated fire control system that combines the proven Aegis weapon system and upgraded airborne early warning aircraft with new long-range anti-air missiles on cruisers and destroyers. To defeat ASCMs at short range, the Navy is upgrading point-defense missiles and electronic warfare systems to destroy incoming missiles or cause them to miss by deceiving and jamming their seekers.

Navy forces will defeat ASBMs by countering each link in the operational chain of events required for an adversary to find, target, launch, and complete an attack on a ship with a ballistic missile. The Navy is fielding new systems that jam, decoy, or confuse the wide-area surveillance systems needed to find and target ships at long range. To shoot down an ASBM once launched, the fleet will employ the Aegis ballistic missile defense system and SM-3 missile. And, to prevent an ASBM from completing an attack, the Navy is fielding new missiles and electronic warfare systems over the next several years that will destroy, jam, or decoy the ASBM warhead as it approaches the ship.

To improve the ability of surface forces to project power, we will field new long-range surface-to-surface missiles aboard cruisers and destroyers in the next decade and improve our ability to send troops ashore as new San Antonio-class amphibious ships replace their smaller and less-capable 30-year-old predecessors over the next two years.

Air

The Navy and Air Force will improve their integrated ability to defeat air threats and project power in the face of improving surveillance and air defense systems. This evolution involves the blending of new and existing technology and the complementary use of electronic warfare, stealth, and improved, longer-range munitions. The carrier air wing in Japan recently finished upgrading to F/A-18 E/F Super Hornet strike fighters with improved jamming and sensor systems and the new E/A-18G Growler electronic attack aircraft. This air wing will also be the first to incorporate the F-35C Lightning II, which will enable new operational concepts that combine the F-35C's stealth and sensor capability with the payload capacity of the F/A-18 E/F to project power against the most capable air defense systems.

Developing partnerships and intellectual capital

Perhaps most importantly, rebalancing the Navy's emphasis toward the Asia-Pacific region includes efforts to expand and mature our partnerships and establish greater intellectual focus on Asia-Pacific security challenges.

First, we are increasing the depth and breadth of our alliances and partnerships in the Asia-Pacific. Our relationships in the region are the reason for our engagement there and are the foundation of our rebalanced national security efforts. Our connection with Asia-Pacific allies starts at the top. Our naval headquarters and command facilities are integrated with those of Japan and South Korea and we are increasing the integration of our operating forces by regularly conducting combined missions in areas including anti-submarine warfare and

ballistic missile defense. We are also establishing over the next year a headquarters in Singapore for our ships that will operate there.

We build our relationships with operational experience. The Navy conducts more than 170 exercises and 600 training events there every year with more than 20 allies and partners—and the number of events and partners continues to grow. Our 2012 Rim of the Pacific Exercise, or “RIMPAC,” was the world’s largest international maritime exercise, involving more than 40 ships and submarines, 200 aircraft, and more than 25,000 sailors from two dozen Asia-Pacific countries. This year RIMPAC included several new partners, such as Russia and India. It also incorporated naval officers from Canada, Australia, and Chile as leaders of exercise task forces. Like our other exercises, RIMPAC practices a range of operations, building partner capacity in missions such as maritime security and humanitarian assistance while enhancing interoperability with allies in sophisticated missions such as anti-submarine and surface warfare and missile defense.

Second, we are refocusing attention on the Asia-Pacific in developing and deploying our intellectual talent. The Naval War College is the nation’s premier academic center on the region and continues to grow its programs on Asian security, while the Naval Postgraduate School expanded its programs devoted to developing political and technical expertise relevant to the Asia-Pacific. We continue to carefully screen and send our most talented people to operate and command ships and squadrons in the Asia-Pacific.

Third, as described above, the Navy is sharpening its focus on military capabilities needed in the Asia-Pacific. Most important is the ability to assure access, given the distances involved in the region and our treaty alliances there. Having a credible ability to maintain operational access is critical to our security commitments in the region and the diplomatic and economic relationships those commitments underpin. We are developing the doctrine, training and know-how to defeat access threats such as submarines and cruise and ballistic missiles through our Air-Sea Battle concept. With Air-Sea Battle, we are pulling together the intellectual effort in needed areas, including intelligence and surveillance, cyber operations, anti-submarine warfare, ballistic missile defense, air defense, and electronic warfare. The Air-Sea Battle Office leads this effort with more than a dozen personnel representing each military service.

Our credibility in these missions rests on the proficiency our forces deployed every day in the Asia-Pacific. We increased our live-fire training in air defense and in surface and anti-submarine warfare by more than 50 percent, and expanded the number and sophistication of training events we conduct in theater with our partners and allies. For example, in RIMPAC 2012, U.S. allies and partners shot 26 torpedoes and more than 50 missiles from aircraft and ships against a range of targets and decommissioned ships.

A Global Fleet

Even as we rebalance to the Asia-Pacific, the Navy will remain engaged around the world. We will maintain our presence to deter and respond to aggression in support of our partners in the Middle East. In Europe we will build our alliance relationships. Our basing of ballistic missile defense destroyers to Spain is part of this effort, as an element of the overall European Phased Adaptive Approach. The home-porting of U.S. ships in Europe will yield greater opportunities for integration with European forces as well.

In South America and Africa we will shift, as the Defense Strategic Guidance directs, to “innovative, low-cost approaches,” including JHSV, AFSB, and LCS. In contrast to our approach today, which is to send the destroyers and amphibious ships we have when available, these new ships will be better suited to operations in these regions and will be available full-time thanks to their rotational crews.

The Asia-Pacific will become increasingly important to our national prosperity and security. It is home to the world's largest and most dynamic economies, growing reserves of natural resources, and emerging security concerns. Naval forces, with their mobility and relevance in peacetime and conflict, are uniquely poised to address these challenges and opportunities and sustain our leadership in the region. With our focus on partnerships and innovative approaches, including new ships, forward homeporting, and rotational crewing, the Navy can rebalance toward the Asia-Pacific while being judicious with the nation's resources. We will grow our fleet in the Asia-Pacific, rebalance our basing, improve our capabilities, and focus intellectually on the region. This will sustain our credibility to deter aggression, preserve freedom of maritime access, and protect the economic livelihood of America and our friends.²¹⁹

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²¹⁹ Jonathan Greenert, "Sea Change, The Navy Pivots to Asia," *Foreign Policy* (www.foreignpolicy.com), November 14, 2012.